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VOL. XVIII. NO. 8



Spotlight Bypass: what's here, what's ahead/15



In Depth Roles managers must play 1D/13

### Crime and punishment

Bills dealing with **DP** crime languish in Congress/12

New lease on life?/14

502213

29C

### TOP OF THE NEWS

All tied up: Three vendors, including Data General Corp., have announced mi-cro-to-mainframe links. Page 2.

Trying perhaps to unload older rent-al and lease agreements, IBM last week raised its convenience agreement rates on most older hardware by 7% to 10%.

Building up its Tower line of supermi-cros, NCR Corp. last week added a Coboloriented processor. The new I-Tower re-places NCR's aging I-9020 minicomputer series. Page 6.

Two more Stars are on the horizon for users. They were introduced last week by Xerox Corp., which lopped almost one-third off the price of its 8010 Star model. Page 6.

Half the pregnancies of VDT opera-tors ended "adversely" during a four-year period at United Airlines' telephone servations office in San Francisco, 9 to 5 reported last week. Page 9.

Simpler than Basic, more powerful and elegant than either Pascal or PL/I and offering debugging, portability and modular programming capabilities that outstrip all three. That is how a member of a University of Toronto research team described Turing, a general-purpose pro-gramming language the team recently de-veloped. Page 43.

The road to the kingdom of on-line, integrated, central data base systems is full of potholes for some application software developers. Page 93.

### International group forcing U.S. hand on Cobol standard

VIENNA The International Standards Organization's working group on Cobol-80 last week bucked tradition and adopted a proposed American National Standards Institute X3J4 Committee standard and modifications before public review or approval by the parent X3 Com-

The move could signal a breakthrough in the deadlocked attempts to reach a Cohol-80 standard

In an unusual move, the ISO Technical Committee 97/Standing Committee 5/ Working Group 8 approved and sent on to

the parent SC5 Committee the most recent Ansi X3J4 proposal — sometimes called the "pink book" — and X3J4's "3" and "D" modification documents. The move came despite the fact that the standard is scheduled to undergo at least one more limited public review — a process that could last into 1985 — before it is submitted to Ansi's X3 Committee.

If the WG8 recommendation is approved, the machinery would be set in motion to adopt an international standard before the Ansi standard is approved, a highly unusual action, sources said.

The Cobol-80 standard has been

See COBOL-80 page 8

### Lotus adds two steps to '1-2-3'

Lotus Development Corp. last week added steps four and five to its fast-selling Lotus 1-2-3 integrated microcomputer software package when it unveiled a single-floppy program that includes word processing, communications, graphics, spreadsheet and data base capa-

The \$695 program, named Symphony, will be available July 2 for the IBM Personal Computer and Personal Computer XT The five-function package requires 320K bytes of random-access memory, but its data base function needs 640K bytes of RAM, the stiffest dose of memory available on the Personal Computer, to operate at full strength, a spokesman said.

Symphony includes a window manage ent system that allows a user to create an unlimited number of windows and to enter data simultaneously through each of them, according to Lotus President Mitchell Ka-

Other features include a word process ing-to-communications link, the ability to store 8,000 records in the data base, a spreadsheet of 8,192 rows by 256 columns, a zoom key for enlarging a window to full screen size and a command language for manual programming.

The word processor, which Lotus described as being similar to those offered by Wang Laboratories, Inc., can combine data

See LOTUS page 8

### Making (and putting) their mark on micro software

When Philip Raymond likens his software testing company to Underwriters Laboratories, Inc. and Good Housekeeping magazine, the comparison is not made casually. Nor is that analogy used solely by Raymond.

Raymond's firm, Peripheral Vision Co. of Marlboro, Mass., is one of at least three companies that currently offer to stamp their seals of approval on microcomputer software that has met their testing requirements. For the other two — the International Bureau of Software Test of Sunnyvale, Calif., and Benchmark Computer Systems, Inc. of Edina, Minn. — as well as for Peripheral Vision, comparison with the Good Housekeeping and UL seals of approval is an important marketing tool to

bolster credibility. IBST is the only firm among the three that deals solely with software testing and approval. The company has been in busisince 1982 and currently employs 26 consultants and full-time software experts

who put new software packages through their paces on a variety of micros in IBST's testing labs.

If a package is fully approved by the test team, according to IBST President William Goss, its manufacturer can display

IBST's Seal of Approval, which is earned by about 15% of the packages tested.

Like Peripheral Vision Benchmark Computer Systems, IBST claims to employ rigorous, structured testing methods that involve at least three experts. "We're inde-

pendent, and we take a systematic, thorough approach," Goss said. "We find problems that the in-house testing team might have overlooked. The software developer is often too involved with the product to be objective, and he might overlook problems we can catch."

Raymond, a former design engineer who

left Digital Equipment Corp. in 1982 to found Peripheral Vision, said the Peripheral Vision Software Seal of Approval can be a powerful marketing tool for a software manufacturer. "Buyers can't judge

software from its packaging or its documentation. They can't choose between 10 15 similar packages simply on what they say on the outside. Our position as an independent software testing firm will help buyers to choose one vendor's package over another's.'

Raymond claimed Peripheral Vision's revenues from software testing grew from 20% to 50% of its annual earnings last year alone. Raymond's network of consultants also reviews technical manuscripts for most major publishing companies. Peripheral Vision has targeted the stamp of ap-proval service at the publishing firms, Raymond explained, as they enter the micro software marketplace.

"We sell a comprehensive strategy of software integrity approval to the software publishing industry. We want to help the publishers of printed media use their established market position to sustain a foray into software publishing and distribution," Raymond said.

Benchmark Computer Systems has tak-

en a slightly different approach to soft-

e SEALS page 10

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NEWSPAPER

### Three tie micros to mainframes

### its small units to IBM CPUs

By Susan Blakeney CW Staff

WESTBORO, Mass. - Data General Corp. has introduced a communications interface that is said to permit direct communications between IBM mainframes and DG's Desktop Generation, Eclipse S/20 and Eclipse C/30 low-end processors. The product is scheduled to make its debut today at the Office Automation Conference in Los Angeles.

The ISMC/2 is a two-channel, front-end, intelligent synchronous micro controller board that enables its processors to offload high-speed communications more efficient file transfer and interactive communications, according to a DG spokesman.

Supported by DG's bisynchronous DG/SNA and X.25-compliant Xodiac communications software products, the ISMC/2 lets the Desktop Generation, S/20 and C/30 systems connect directly to a Systems Network Architecture/Synchronous Data Link Control or public data network, as well as DG's own network, the vendor

### Direct tie to IBM CPUs

The ISMC/2 gives the Desktop Generation a facility for communi-cating directly with IBM mainframes via DG's bisynchronous and DG/SNA

The product, which runs under DG's AOS and AOS/WS operating systems, is a single 7- by 9-in. printed-circuit board that reportedly fits into any unreserved slot in the CPU chassis or expansion module of a Desktop Generation Model 10SP, Eclipse 20 or Eclipse 30, according to a spokesman for the vendor.

The ISMC/2 is composed of a 16bit Microeclipse processor with 32K bytes of dynamic random-access memory, a host I/O system and two communications channels. Each channel is capable of full-duplex communications, with modem control and a choice of interface, the vendor

At press time, the price for ISMC/2 was set at \$1,650. Additional information is available from DG, located at 440 Computer Drive, Westboro,

### CORRECTIONS

An announcement of the Cause online member data base [CW, Jan. 23] should have stated that the data base includes information from more than 150 different applications divided into 10 areas.

An announcement of Syncsort Inc.'s Syncsort OS Release 2.5 [CW Feb. 6] failed to state that the major enhancement to the new release is performance improvements of between 15% and 35%.

### ties IBM micro micro emulate to SI software

By John Gallant

ANDOVER, Mass. - Software International Corp. last week entered the micro-to-mainframe communications market by announcing a realtime link between its mainframe general ledger package and a variety of applications that run on the IBM Personal Computer.

Smart Link enables Personal Computer users to extend the data extraction and manipulation resources of Software International's on-line General Ledger and Financial Reporting System at the micro level, a spokesman said.

The product is said to provide for on-line, real-time extraction of live data and does not use any batch pro-cessing mechanisms to create a shadow file accessed by the micro.

Smart Link reportedly requires no modifications to Software International's General Ledger and Financial Reporting System on the mainframe. It provides users with the ability to perform operations such as data input and report production on the Personal Computer that would otherwise be performed on an IBM 3270 terminal

In addition, Smart Link reportedly uploads budget information to appropriate mainframe general ledger files under comprehensive security and audit trails.

Restricted upload capabilities are provided to prevent loss of mainframe data integrity, the spokesman said. The security systems are the same as those that govern access to Software International's mainframe applications.

Smart Link also allows users to load data into a variety of current spreadsheet packages and data base management systems, including Lotus Development Corp.'s Lotus 1-2-3, Visicorp's Visicalc and Microsoft, Inc.'s Multiplan. It will also operate with micro applications that incorporate Software Arts, Inc.'s Data Interchange Format.

Smart Link does not require rekeying of commands in order to rerun a download or upload session, the spokesman noted. It automatically recalls a session if it was stored in Smart Link's library; sessions can be modified to give new download or upload specifications.

Data from the General Ledger and Financial Reporting System can be placed into a specific area of the user's spreadsheet for greater flexibility, according to a spokesman for the vendor.

Smart Link will run on the IBM Personal Computer or Personal Computer XT equipped with Technical Analysis Corp.'s Irma board coaxial

The software is priced at \$2,995 per micro from Software Internation-1 Tech Drive, Andover, Mass. 01810.

### DG board links | Real-time link | Products help 3270 terminal

SANTA CLARA, Calif. - A oneyear-old data communications vendor claims to have tightened the inte-gration between IBM Personal Computers and CPUs with the introduction of a micro-to-mainframe link that reportedly enhances a Personal Computer's 3270 emulation features.

Forte Data Systems, Inc.'s microto-mainframe link consists of six related hardware and software mod-

■ Forte-PJ, an emulation and adapter board that provides IBM Personal Computers and Personal Computer XTs with a coaxial cable interface to 3270-based networks and allows the micros to emulate 3278 and 3279 display terminals.

■ Forte-Graph, a "daughter" board that enables Personal Comput-ers to duplicate the IBM 3279 color display station's color graphics capabilities and produce hard-copy output with the same resolution as the micros' display screens.

■ Three File-Net packages that permit mainframes to download whole TSO, CICS or CMS files at once rather than in one-page sections.

Forte-Call, a Personal Computer-resident communications utility that allows remote terminal users to dial into 3270 coaxial cable networks and thus gain access to corporate

Forte-PJ occupies one Personal Computer or Personal Computer XT chassis slot and - in an effort to simplify future product upgrades — implements all its associated software on diskettes rather than in pro-

grammable read-only memory.

When equipped with the board, IBM Personal Computers can double as terminals interacting with host mainframes and as stand-alone processors operating in the PC-DOS operating system mode, according to Forte Product Manager Ron Rawson. Users can reportedly switch back and forth between a mainframe session and stand-alone operation by touching just one button on a Personal Computer's keyboard.

Forte credits its PJ board with supporting up to 32K bytes of buffer memory, eight times as much as the company's existing 3270 emulation product, the PC78-2. This expanded storage capacity, in turn, allows an IBM Personal Computer or Personal Computer XT to emulate a larger set of 3279 color graphics capabilities than was previously possible with the 4K-byte PC78-2, Rawson said.

In addition to its increased buffer memory, Forte-PJ incorporates an in-terface expansion bus into which users can plug various daughter boards and thus enhance a Personal Computer with additional "personality" or functionality, he said

One such daughterboard is Forte-Graph, which rides piggyback on the and gives IBM micro users ac-See FORTE page 4

### **NEWS SUMMARY**

IBM raised by 7% to 10% its conve nience agreement rates on most older hardware and the license fees for about half its system and language program

Cortex Corp. unveiled an application generator for the Digital Equipment Corp. VAX-11 that it said virtually eliminates hand-coding/4

A Cobol-oriented version of its Tower 1632 supermicro has replaced NCR Corp's I-9020 minicomputer line/6

Xerox cut the price of its 8010 Star microcomputer by almost one-third and added stand-alone and remote workstations to the Star line/6

The National Association of Working Women, 9 to 5, said 50% of the pregnancies of VDT operators at United Airlines' telephone reservation office in San Francisco ended "adversely" over a four-year period/9

The Association for Computer Opera-tions Managers predicted an average salary increase of 7% for computer operations personnel this year/11

Little action is slated for a variety of federal computer crime bills under consideration by Congress/12

A recommendation from the U.S. Postal Rate Commission, due this Friday, could rejuvenate Ecom/14

Product Spotlight: Bypass/15

The Yankee Group recently offered insights on IBM hardware strategies/17

The former marketing director of Sys-tems Development Co. has been in-dicted on charges of trying to bribe a Massachusetts official/19

Armed with printouts, Indianapolis police nabbed hundreds of scofflaws at

An IBM consultant has compiled 600 terms that he hopes will become the standard sign language of DP terminology for deaf DP professionals/27

A service bureau doubled in a year the number of tax returns it processed for 400 accountants/28

The Long Island Lighting Co. has bro-ken the 'language barrier' between computers and employees/29

International Report/24
Turnaround Time/26 Calendar/30

Fourth-generation software/ID/1 Roles DP managers must play/ID/13

SOFTWARE & SERVICES/43 COMMUNICATIONS/50 SYSTEMS & PERIPHERALS/57 MICROCOMPUTERS/69 COMPUTER INDUSTRY/93

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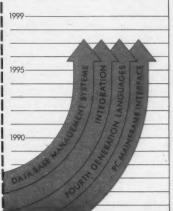
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### **Application generator** ends hand-coding for VAX license fees raised by IBM

WELLESLEY, Mass. -Cortex Corp. last week introduced an application generator for Digital Equip-ment Corp. VAX-11 superminis that it said virtually eliminates the need to write code for standard applica-

Called the Application Factory (Factory), the software allows systems analysts and programmers to develop applications through an interactive terminal dialogue. It constructs applications that include screens, reports, computations and data base management. Programs can be customized and regenerated using Cortex Application Builder (Builder), a high-level language, a

Cortex spokesman said.

Factory can be used to prototype working models and is said to eliminate much of the program design, coding and testing process. It genermodules written in Builder, which can be modified.

Factory provides standard procedures, such as menu screens and the standard mechanisms for using them. such as menu items, which the designer fills in interactively. Program modules can be specified interactively and code generated automatically.

Factory ensures that a generated module is consistent with the data and with other modules, the spokesman said

Among the activities supported by Factory are data set creation, data dictionary specification, the linking of data sets into logical views, screen layout, report layout, definition of

menus, coordination of logical flow, data validation specification and data extraction specification.

An optional facility called Customizer allows screen and report characteristics to be changed. The Applica-Accelerator, also an optional facility, generates object code from Factory source code, enabling programs to run as efficiently as Cobol programs, the spokesman claimed. Without Accelerator, Factory generates a pseudo-code that executes more slowly.

Still another optional module, Application Targeter, allows applica-tions to be generated in object code to run on other machines within the DEC line, including the VAX-11 series, PDP-11 series and DEC Professional 350.

The Run-Time System, also an option, provides an interface to the file

system of the target machine. The End-User Facility is an option that gives end users limited query, sort and report-generation functions. For the VAX-11/750 and VAX-11/

the Application Factory costs \$25,000. The cost of the options are: Customizer, \$10,000; Application Accelerator, \$15,000; Application Targeter, \$15,000; Run-Time System, \$2,500 and End-User Facility, \$8,000.

A package made up of the Application Factory, Accelerator or Targeter, Customizer and End-User Facility costs \$49,000. All products cost less for the lower end of the VAX-11 line.

Cortex is located at 55 William St., Wellesley, Mass. 02181.

### Cornellian wins ACM award

ITHACA, N.Y. - A postdoctoral associate in the department of computer science at Cornell University has won the 1983 Doctoral Disserts tion Award of the Association for Computing Machinery (ACM).

Thomas Reps won the award for "Generating Language-Based Envi-

ronments," a thesis he wrote while earning his Ph.D. in 1982. The award includes a \$1,000 check, publication of his thesis by MIT Press and royalties from sale of the book.

The award was announced at the ACM Computer Science Conference Feb. 14-16 in Philadelphia.

### FORTE from page 2

cess to all the 3279 graphics software packages residing in central mainframes. The board thus enables Personal Computers to support as wide a selection of colors as the 3279 and to provide the same display resolution and extended character attributes, Rawson said.

Complementing Forte-Graph are three mainframe-resident file transfer packages — TSO File-Net, CICS File-Net and CMS File-Net. All three are extensions of their respective IBM subsystems' command language and are written in 370 assembler, a feature that maximizes communica-

tions efficiency, Rawson said. The result is that the packages allow complete TSO, CICS or CMS files to be downloaded from a mainframe all in one operation rather than in one small chunk at a time. File-Net therefore overcomes one of the main limitations of usual 3270 emulation. which typically requires files to be transmitted to a Personal Computer in one-page segments, according to Forte President James Ottinger.

After being downloaded from a host CPU to a Personal Computer, data is reportedly displayed in PC-DOS formats to simplify integration of the files with popular microcomputer applications like spreadsheets

and word processing.

The last of the six Forte communications is Forte-Call, which is said to allow any remote Ascii device to retrieve data from a central mainframe through a host Personal Computer.

Forte-Call costs \$295, compared to \$1,195 for the Forte-PJ board and \$1,395 for the Forte-Graph board and all its associated software. The TSO File-Net and CMS File-Net pack ages license for \$1,000 each, while the CICS version is available for a one-time license fee of \$10,000 per

All six of the Forte micro-to-mainframe link products will be available for shipment in April from the company at 1500 Norman Ave., Santa Clara, Calif. 95050.

### Convenience pact rates,

Most users affected

by the increases

are holders of lease

IBM Credit Corp.

RYE BROOK, N.Y. - In what appears to be an effort to rid itself of older rental and lease agreements, IBM last week raised its convenience agreement rates on most older hard-

ware by 7% to 10%. At the same time, the company also raised the license fees on about half its system and language program

products by the same 7% to 10% Monthly maintenance rates on a handful of older products also under-

went changes. Some were increased by as much as 10%, while others were decreased by 10%.

Convenience lease and rental agreements are those offered directly through rather than the IBM Credit Corp. Most users affected by the increases - effective June 1 - are holders

of lease and rental agreements signed before IBM established the IBM Credements signed

Processors affected by the increases include the 4321, 4331 and 4341; the 8130 and 8140; the System/ 34; and the 3080 series. Exempted from the increases were the System/ 38 and systems announced after the formation of the IBM Credit Corp., which include the 4361, 4381 and 8150, a spokesman said.

As examples of the price increases, IBM said a System/34 Model D23 processor, which formerly carried a convenience lease price of \$1,860/mo, will now cost \$1,990. The convenience rental fee on the same model is now \$2,189 instead of

A 3084 Model Q48 processor, which formerly carried a convenience monthly lease rate of \$289,920, now costs \$310,200. The rental fee for the same processor is now \$387,000/mo instead of \$362 400

Initial and monthly license fees on roughly half the systems and language software program products and a small number of applications program products were

sed 7% to 10%. The increases in initial license fees are effective immediately; monthly license fee increases are effective June 1

The license fee increases affect about 20% of all IBM program products and include the MVS/SP operating system, CICS/OS, VM/High-Performance Option, IMS/Data Base/Data Communications, all software for the System/38 and System/34, the DPPX operating system for IBM's 8100 line of distributed processing systems and OS/Cobol. Monthly software service

charges on all IBM software were also increased by 7% to 10%. For example, users formerly paid \$1,170 for the monthly liand rental agree-ments signed before for MVS-SP Version 2 IBM established the Job Entry Subsystem 3. They will now pay \$1 250

DPPX/Distributed Presentation Services

(DPPX/DPS) carried a basic licens charge of \$186, which has been increased to \$199. The MLPSC has been increased from \$18 to \$19.

Finally, IBM announced both price increases and decreases in monthly maintenance fee of a handful of IBM hardware products. The price changes range from 10% decreases to 10% increase

The decreases are effective March , and the increases are effective June 1. IBM said.

Major systems that received price decreases include the 30 series of mainframes and the smaller System/ 3 and System/7 processor lines. Systems hit by maintenance price increases include the 3431 and the

\$5,810/mo maintenance charge on a 3033U Model U16 processor has been dropped to \$5,520. But users of 4331 Model J11 processors will now pay \$351/mo instead of

Equipment purchase prices were left unchanged, as were IBM Credit Corp. three-, four- and five-year term leases. According to the spokesman for IBM, the price changes were a result of a normal business review

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If you're tired of betting on sort programs that empty your pockets of resources and are tough to handle, give us a call. We'll arrange to have SyncSort OS 2.5 run a few furlongs on your own turf.

### NCR brings out Cobol-oriented supermicro

By Tom Henkel

DAYTON, Ohio — NCR Corp. last week replaced its aging I-9020 line of minicomputers with a Cobol-oriented version of its Tower 1632 supermi-

Called the I-Tower, the new system offers two to six times the internal performance of the I-9020, NCR said. The I-Tower's hardware is virtually identical to the Unix-based Tower system announced by the firm a year ago, the vendor said, noting that both are based on Motorola, Inc.'s 68000 microprocessor.

The I-Tower supports RM/Cobol, a specialized version of Cobol developed by a long-time supplier of NCR software, Ryan-McParland Corp. of Rolling Hills Estates, Calif.

The I-Tower system also runs Ryan-McFarland's RM/COS, which optimizes the execution of Cobol programs.

Users of the original Tower 1632 can now run Cobol on their systems. This, according to Jim Krohe, program manager for the Tower line, can be done in two ways. Users can run RM/Cobol directly on the Unix operating system, or they can run both Unix and Ryan-McFarland's RM/ COS. He noted, however, that the operating systems cannot run concur-

Likewise, users of the I-Tower can, if they wish, purchase the Unix oper-

ating system for nonconcurrent use.

Krohe said NCR plans to offer RM/
COS, RM/Cobol and Unix packages to
Tower 1632 and I-Tower users, but
the packages are not yet available.

the packages are not yet available.

While NCR representatives seemed unclear on how the firm plans to market the I-Tower, its assistant vice-president of interactive systems, John C. Duritsch, said one group of potential users is microcomputer users who have exhausted the capabilities of their current systems. He noted that from a performance standpoint, the I-Tower offers roughly the same power as IBM's System/36 or Burroughs Corp.'s B93 series of

The I-Tower can run some existing I series applications, including NCR's

Interactive Financial Management System (IFMS). It also supports offthe-shelf programs that operate under Ryan-McFarland's RM/Cobol compiler and RM/COS operating system.

While the I-Tower is not directly compatible with larger processors in the NCR line, users of RM/Cobol can migrate to the larger I-9300 line of mainframes by making a software conversion, according to Raymond B. Smith, director of general-purpose systems product marketing. To switch to the I-9300 line, I-Tower users will have to make file modifications and recompile their Cobol programs. Smith claimed the conversion process is a minor task, requiring about two burs per programs.

about two hours per program.

The I-Tower can handle 16 users and is equipped with 512K bytes of standard random-access memory (RAM). It can be expanded with a processor memory control module that offers up to 2M bytes of RAM.

The I-Tower supports up to two 5½-in. floppy disk drives, each offering 1M byte of storage, and a maxi-

mum of two 5¼-in. Winchester disk drives, each offering up to 46M bytes of unformatted storage. Two 8-in. Winchester disk drives, each offering up to 84M bytes of unformatted data storage, can be used in addition to the 5¼-in. Winchester drives for a total disk storage capacity of 260M bytes.

The I-Tower includes a 90 in./sec streaming tape drive, which can store 21.6M bytes of unformatted data, as well as a battery-powered memory support feature designed to protect the system against power fluctuations.

An I-Tower processor with 512K bytes of RAM, 46M bytes of Winchester disk storage, a 1M-byte flexible disk drive, a 20M-byte streaming tape drive, a 125 line/min printer, CRT terminal, eight RS-232C I/O ports, IBM 2780/3780 remote batch communications protocols, RM/COS and RM/Cobol costs \$28,880. It will be available next month and distributed through the firm's direct sales force.

NCR's corporate headquarters is located in Dayton, Ohio 45479.

### ANALYSIS

### NCR becomes first to replace mini with supermicro

By Tom Henkel CW Staff

NCR Corp. has scored a first with its newly announced I-Tower Coboloriented supermicrocomputer: It became the first of the big five computer vendors to replace an existing minicomputer line with a supermicrocomputer.

Whether NCR can parlay the newly announced system into a highly successful product, however, remains to be seen.

NCR stated that the I-0020, the mini line replaced by last week's announcement of the I-Tower, has been its most successful product to date, with more than 20,000 installed systems. However, NCR representatives who presented details of the I-Tower last week did not seem to have a clear focus of who that system's target user would be.

One obvious market for the I-Tower is as a replacement processor for I-9020. NCR said the I-Tower can operate up to six times faster than the I-9020, but users who want t make the switch from an I-9020 must convert from NCR's Imos operating system to Ryan-McFarland, Inc.'s RM/COS.

The other market NCR appears to be eyeing for the I-Tower are microcomputer users who have exhausted the capabilities of their single-user systems. How NCR plans to attack that market remains unclear.

Raymond B. Smith, NCR's director of general-purpose systems product marketing, noted that NCR has approached traditional NCR third-party software developers to adapt existing Cobol programs for the I-Tower. But that raises the question of how that list of Cobol programs compares with the list of Basic programs available for microcomputers. And will NCR be able to convince micro users, who have been weaned on Basic, to switch to Cobol?

Jim Krohe, NCR's program manager for the Tower line, noted that there are currently more than 1,000

off-the-shelf programs that run under RM/COS. Krohe said that it is a fairly simple process to convert other Cobol programs to run under RM/COS

NCR estimates it will take users 15 minutes to two hours per program to convert to the RM/Cobol compiler. Krohe said the amount of time the conversion takes depends on how much non-Ansi-standard code a given Cobol program uses. Users of strict Ansi-standard Cobol would just have to recompile Cobol programs to use them under RM/Cobol.

Regardless of whether NCR cracks open a new market for small business users, the I-Tower may carve out an alternate, profitable niche for the Tower line, said Dave Moschella, an analyst with the Framingham, Mass., market research firm International Data Corp.

According to Moschella, NCR has basically acted as a systems integrator in developing the Tower line, basing it on the Motorola, Inc. 68000 microprocessor, OEM peripherals and third-party software. The original Tower 1632, announced about a year ago, has shown moderate success as a small business system, Moschella said, noting many Tower sales have gone to systems integrators, not end users.

But NCR's assistant vice-president of interactive systems, John C. Duritsch, disagreed with Moschella. He contended that NCR has also been able to sell the Tower 1632 to end users. In any case, both Moschella and Duritsch agreed that NCR is fairly pleased with sales of the Unix-based version of the Tower.

Moschella said the Cobol-oriented I-Tower is probably guaranteed at least limited success just on the strength of the I-8020 market. Moschella added that since NCR is simply remarketing an existing system to a new audience, the development costs associated with the newly announced I-Tower are very low.

### Xerox cuts 8010 Star price; adds stand-alone, remote models

By Tom Henkel CW Staff

PALO ALTO, Calif. — Xerox Corp. appeared to be trying to rekindle a market for its 8010 Star microcomputer last week when it slashed \$5,000 from the micro's \$15,055 purchase price and added stand-alone and remote workstations to the Star line

Announced in 1981 to operate with the Ethernet local-area network, the 8010 Star was greeted with a great amount of interest because it employed such innovative features as multiple windowing, a mouse and

icons. However, the network workstation was never very successful because, industry watchers say, it was far too expensive and possibly too sophisticated for what was then a new market. Critics of the system said Xerox simply missed what turned out to be a very fertile market for smaller, stand-alone microcomputers.

Currently, Xerox apparently is trying to reignite the Star. The standalone and remote workstation models announced last week are essentially identical to the original network workstation, but they do not require users to buy cabling and pay the ser-

vice charges for Ethernet.

The stand-alone model, which costs \$8,905, is equipped with the same proprietary 16-bit microprocessors used in the network workstation. It comes with 512K bytes of random-access memory; a 10M-byte hard disk drive; a 1.2M-byte, 8-in., double-sided, double-density floppy disk drive; and Xerox's proprietary Mesa operating system.

What is missing from the system are circuit boards that allow it to be connected to Ethernet. However, the stand-alone unit is field upgradable to the remote workstation and the

network workstation, Xerox noted.

The remote workstation is offered in the same configuration as the stand-alone workstation, but it is equipped with communications capabilities that allow it to communicate with an Ethernet system via an RS-232C port. To the user, the workstation operates as if it were attached to a local-area network, but the user also has the ability to perform local computing.

Xerox made its announcement through its Office Systems Division, located at 3333 Coyote Hill Road, Palo Alto, Calif. 94304.

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### COBOL-80 from page 1

broiled in controversy since the first Ansi draft standard was released in 1980. Critics charge that conversion to Cobol-80 would be expensive and time-consuming. Supporters say the standard would add significant features that could make Cobol a viable alternative to many fourth-generation languages.

### Action 'closes debete'

The ISO action on the X3J4 standard "effectively closes debate on the American side," said Jerome Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn., and a member of the Ansi X3J4 and ISO Cobol committees. "I expect [Ansi] will also go along and adout this as a standard."

Another X3J4 Committee member concurred that the action puts pressure on Ansi to come to an agreement quickly. "The implications are that we are essentially going to lose some control on finalizing a standard," said Lawrence K. Madison, associate director of data processing at the Travelers Insurance Co. in Hartford, Conn.

Lemuel Skidmore, manager of systems development and educational services at New England Data Services in Guilford, Conn., called the ISO action "very important. . . . It says the international community is not pleased with the slowness of our process, and they're going off on their own."

"It's a political game that's being

played," Madison said. "The international community is essentially saying, 'Hey, Ansi, let's get going on this."

Garfunkel, who has been an outspoken proponent of a new standard, said adoption by the ISO SC5 Committee will force the federal government to adopt the standard as a base for hardware procurement. He noted that hardware vendors will probably follow the government's lead.

Skidmore agreed that hardware vendors may add impetus to the project by standardizing their compilers based upon whichever standard is adopted first. "If I were IBM, I wouldn't want to be married to two different standards. I'd say it's more important that they match up," he said

However, Madison pointed out that any ISO action is still subject to a six-month international letter ballot, at which time problems could arise. "If the international organization says, 'Let's throw caution to the wind and try to pass something through,' they may find out what X3J4 found — that it's not that easy to convince users who have a substantial investment [in existing programs]." Madison maintained. "Just because [WG8] has made a recommendation, doesn't mean it will be adopted."

The Data Processing Management Association's (DPMA) principal representative to the X3 Committee indicated that the standardization process is too far along to be rushed by international pressures. "We feel

### ISO changes procedures for making Cobol revisions

VIENNA — At the same time that it approved and sent on for review the latest version of the Ansi X3J4 Committee's proposed Cobol-80 standard and modifications, an International Standards Organization (ISO) working group last week also adopted a resolution to change the current procedures for revising the language.

The resolution approved by the ISO Technical Committee 97/ Standing Committee 5/Working Group 8 proposes to add new features to the Cobol standard every two years. It also extends the period between complete overhauls of the standard to 10 years.

Currently the standard is slated to be revised entirely every five years. But controversy over proposed revisions has delayed the adoption of the Cobol-80 standard by more than three years.

According to the resolution's originator, Jerome Garfunkel, a member of the Ansi X3J4 and ISO Cobol committees, the resolution would make it easier to keep Cobol

current with state-of-the-art languages. "Very few people ever had complaints about new features," said Garfunkel, president of Jerome Garfunkel Associates, Inc. in Litchfield, Conn. "This proposal is designed to isolate new features and speed up development."

But critics believe adoption of the dual schedule could pose serious compatibility problems. "If you're going to slow down the clarification process, you're dropping the portability issue," said Lemuel Skidmore, manager of systems development and educational services at New England Data Services at New England Data Services in Guilford, Conn. "The faster you introduce new features, the less time you have to clarify them"."

Skidmore noted that the resolution could result in a proliferation of incompatible compilers that include new features that have not been fully studied. "If we keep changing the standard, we open the door to more incompatibility," he said.

that if the progress that's been made on X3J4 continues, we'll see a draft standard that DPMA can approve shortly," Art Dubnow, who is chairman of the DPMA's Standards Committee, said.

### LOTUS from page 1

base functions, communications, spreadsheet and graphics and allows users to preview documents as they will appear when printed.

The communications package combines terminal emulation, automatic dial-up and logon to remote data bases, data capture, point-to-point file transfer and user control of all terminal parameters. Users can instantly suspend a communications session, analyze the captured data using Symphony and return to the communications mode, the spokesman claimed.

The forms-oriented data base lets the user enter a list of items to be included and automatically creates the basic data base structure. It includes report generation employing the spreadsheet and, when combined with the word processor, offers the ability to perform mail-merge functions.

The expanded spreadsheet is compatible with Lotus' 1-2-3 spreadsheets and includes a new ability to manipulate text as well as numeric information in spreadsheet models.

Asked if Symphony would be adapted for the IBM 3270 Personal Computer, Kapor said his company had as yet made "no definite commitment" to adapt the product to micros other than the Personal Computer and Personal Computer XT. However, he added that Lotus has a broad intention of making Symphony available eventually on all boxes that can run 1-2-3.

At present, 1-2-3 also operates on Texas Instruments, Inc.'s Professional Computer; Zenith Data Systems Corp.'s Z100; Wang Laboratories, Inc.'s Professional Computer; Digital Equipment Corp.'s Rainbow 100; Bytec Management Corp.'s Hyperion; Grid Systems Corp.'s Compass; and Compaq Computer Corp.'s Compaq.

"We would like to become preeminent in the software industry. But we have to demonstrate — to ourselves, to the financial community and to users — that Lotus is here to stay," Kapor told the members of the press who gathered for the announcement at the Pierre Hotel here. He went on to say that the company, which turned a \$14.3 million profit last year, was threatened not by "a mythical software shakeout," but by the challenge of marketing its own new products.

As an introductory offer, owners or new pur-

### 'Symphony' gets hesitant bravos

NEW YORK — Users gathered at the Pierre Hotel here last week to hear Lotus Development Corp. announce its Symphony integrated software package were excited about the product, but they suggested that Lotus 1-2-3 devotees may not yet be ready for it.

Frank Tanzillo, business systems analyst at Corning Glass Works, said Symphony is "beyond the leading edge" of most users' technical accomplishments. "It's easily the most powerful thing out there, but it will be a while before people are ready to take full advantage of it," Tanzillo said.

But software specialist Esther Dyson, president of Rosen Research Co., said users would not be dissuaded from buying Symphony even if they have yet to exhaust 1-2-3's capabilities. "You don't have 1-2-3 and then have Symphony for dessert," she said, noting that the five-function tool will appeal to a broader market.

Even so, James I. Magid, an electronic connector industry analyst at L.F. Rothschild, Unterberg, Towbin, said the WP or communications functions alone would convince many users to pay Lotus for the new product.

users to pay Lotus for the new product.

Dyson said that Symphony's \$200 introductory price for 1-2-3 users would allow the new software product to ride the coattails of the hotselling package. She added that Lotus does not "want to cannibalize" the market for 1-2-3 and so is giving users an incentive to buy both products.

chasers of Lotus 1-2-3 can buy Symphony for an additional \$200. David McElfresh, vice-president of product development for Lotus, said the offer, due to run for three to six months, was designed to provide "an easy path" for upgrading to the higher priced product and "to protect our user base." Lotus is at 161 First St., Cambridge, Mass. 02142.

### Appeals court calls moonlighting on system criminal

By James Connolly CW Staff

INDIANAPOLIS — Using an employer's computer for moonlighting is just as much of a crime as the surreptitious tapping of telephone, power or CATV lines, an Indiana appeals court has ruled.

The three-judge Second District Court of Appeals late last month reinstated the theft convictions of a former computer programmer for the Indianapolis Department of Planning and Zoning. The court said that Michael McGraw must face sentencing for using the city's IBM 3031 computer in connection with his second job, selling a franchised diet product called Nature Slim.

McGraw faces a maximum penalty of four years' imprisonment and a \$10,000 fine.

The appeals court ruling, which defense attorney Phillip Melangton has asked the court to reconsider, reversed a Marion County Superior Court judge's querride of a jury verdict of guilty on two theft counts. That judge said Indiana's theft law wasn't specific enough to cover the theft of computer time.

McGraw's attorney had likened McGraw's actions to a worker "using the office xerox machine to copy a recipe for his wife." He said there were only 35 pages of Nature Slim-related work — such as client lists and form letters — in the 1,100-page printout of McGraw's computer library.

But County Deputy Prosecuting Attorney James Warden appealed to the higher court, which ruled that "computer services, leased or owned, are a part of our market economy in large dollar amounts. Computer time is a service for which money is paid...thus it is property."

amounts. Computer time is a service for which money is paid... thus it is property."

Now involved in computer sales, McGraw was fired by the city in 1981 for failing to complete his work, apparently because he was working on his second job on city time, according to Warden.

### VDT operators report 'adverse' pregnancies

By David Myers CW New York Bureau

NEW YORK — The National Association of Working Women, 9 to 5, said here last week that it has uncovered a work site where 50% of the pregnancies of VDT operators ended "adversely" over a four-year period. United Airlines' telephone reser-

vations office in San Francisco was named as the site where the pregnancies of 48 VDT operators ended in 15 miscarriages, one stillbirth, one death of a newborn infant, two children born with birth defects, two premature deliveries and three other undisclosed "problems" between 1979 and this year.

"We're not pointing the finger only at [VDT] manufacturers," Karen Nussbaum, executive director of the Boston-based labor organization, said at a news conference here last Thursday. She admitted 9 to 5 had not identified the cause of the pregnancy problems and was unable to give the name of the manufacturer of the terminals at the United reservations of-

Nussbaum said 9 to 5 has asked the National Institute of Occupational Safety and Health to investigate the United work site.

A spokesman for United Airlines in Chicago cited studies by the Center for Disease Control and the National Academy of Sciences finding "no evidence that radiation emitted

Codex to OEM

MANSFIELD, Mass. Corp., a manufacturer of modems and multiplexers, moved to diversify its product line last week by intro-

agreement.

**Ungermann-Bass** local network

ducing a local-area network that is

being supplied to the company by Ungermann-Bass, Inc. under a five-year

Under terms of that agreement.

Codex will market, install and maintain Ungermann-Bass' Net/One local

network under its own name. It will be the first member of a family of new networking products called the Codex 4000 series. Ungermann-Bass

will also continue to market Net/One.

Adopting an unusual tactic in the marketing of local-area networks, Codex will offer one- to five-year

lease options for network hardware

Like Ungermann-Bass' Net/One, the Codex local network will be available in either broadband or

baseband versions or in a hybrid version, where baseband "feeder" net-

and software components.

[by VDTs] reaches or exceeds any international standard of safety and health." Noting the "vast majority" of VDT operators are women of reproductive age, the spokesman said that "clusters of problem pregnancies will occur by statistical chance alone" and are unrelated to VDT use.

Dr. Jeanne M. Stellman, a Columbia University public health school professor brought to last week's news conference by 9 to 5, agreed there is "no proven link" between VDT radiation and health problems. She went on to note that there is also "no evidence of widespread birth defects" among VDT operators.

Nevertheless, Stellman maintained that the U.S. trails the "rest of the world in providing health protection for VDT workers.

Nussbaum acknowledged that the stress caused by VDT work could be relieved by "painfully simple solu-tions" undertaken by employers without VDT design or manufacturing changes. However, she said that 9 to 5 is "calling for new standards for manufacturers," including metal shielding for terminals.

The labor group leader said 60% of

the terminals manufactured in the U.S. do not meet international safety standards. Bringing the rest "up to

snuff" would be "cheap in comparison to the human costs.

The association also releas sults of a voluntary survey of 871 of the nation's 10 million VDT operators, showing that over half experience eye or muscle strain and 45% reported pregnancies ending in miscarriage, abortion, stillbirth, early death of the infant, premature de-livery or major birth defects.

At the same time, 48% of those responding to 9 to 5's questionnaire said their health was "about the while 38% described theirs as "slightly worse" and 10.9% as "much

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works can be interconnected with a high-capacity broadband backbone network. Other support options available from Codex for the network include initial site survey and the design and installation of the ca-

Codex reported that a typical local net configuration would cost between \$450 and \$750 per port. Codex is located at 20 Cabot Blvd.,

Mansfield, Mass. 02048.

### Strict testing the vendors' aim

Many of the companies that submit their microcomputer software products to the International Bureau of Software Test (IBST) are not seeking that company's seal of approval.

Those software manufacturers, according to IBST President William Goss, simply want their products to undergo strict, out-of-house testing that may reveal problems their own quality a ance experts may have missed. In addition to testing, IBST will build test data sets that its clients, which include Digital Research, Inc. and Verbatim Corp., can utilize repeatedly.

"We relieve their designers of test work and allow them to focus on developing new products," Goss said. "Also, our thorough testing can save a software manufacturer quite a lot of money because we catch problems

that would otherwise have to be fixed in the field."

IBST charges between \$5,000 and \$25,000 to test a microcomputer package. Some tests run as high as \$100,000, depending on the number of functions incorporated in the package.

In comparison, the certification processes offered by Peripheral Vision Co. and Benchmark Computer Sys-Inc. are relatively cheap. Both firms charge be-tween \$400 and \$2,000 to test and approve most micro packages.

Peripheral Vision President Philip Raymond guarantees a four-week turnaround time for certification. Benchmark claimed an average three-week turnaround record, and IBST said its seal of approval testing process takes anywhere from four to 10 weeks, depending on the sophistication of the micro package.

"Narrow-scope programs are easy to test," Goss said. "But a micro operating sys-tem or a multifunction application takes considerably longer to review because there are many more interrelationships to study."

One of the most common problems IBST encounters with micro packages is poorly written documentation, a flaw that Raymond and Ken Thoreson of Benchmark also highlighted.

'First, we take the package's documentation grade it, just like in school, Thoreson said. "Then we match the documentation to the operation of the software itself to see how useful the manuals are to the user. Many times the documentation is so poorly written it's

### SEALS from page 1

ware testing and approval, according to Vice-President Ken Thoreson. The Minneso ta firm, an established retailer of turnkey financial systems, will not only grant its Benchmark Seal of Approval, but will publish and market a package for its developer.

There are a lot of people out there buying micro software," Thoreson said. "But a lot of that software is developed by loners and entrepreeurs who often don't utilize the most stringent testing methods. That can be very frustrating and costly for the

'We can ensure that the package you're buying is a quality product. That's quality product. That's where the UL and Good Housekeeping comparison comes in."

Both Peripheral Vision and IBST offer testing for and its of other testing for minicomputer software, but Raymond and Goss said de-mand for that service has not yet developed. All three ex-ecutives admit that marketing their approval is the biggest obstacle

### Carrier promises reduced telex rates

NEW YORK - Rates "up to 60% below those charged by traditional telex services' were promised earlier this month by International Record Carrier, Inc. when it began marketing its Supertelex service in the U.S.

A telex transmission be-tween the U.S. and the UK,

Hong Kong or Israel costs 75 cents per minute, said International Record Carrier President James McKenna. To continental Europe, the perminute price is 95 cents; to anywhere else, it is \$1.85.

All International Record Carrier telex traffic goes directly from the U.S. customer's terminal to a computerized switch in London. It is forwarded to other countries from there if necessary.

terminal-computer hookup is provided by GTE Telenet Communications Corp.'s packet-switched network at no additional charge to the customer. This arrangement eliminates the delays inherent in competing services, which accumulate outbound international telex traffic at store-and-forward switches in New York, Miami and other U.S. gateways before transmitting it overseas. McKenna explained.

International Record Carrier traffic is transmitted to London at approximately 1,200 bit/sec, considerably faster than traditional telex service, he added.

McKenna reported that his company has developed a software package which "bypasses the complicated accessing procedures of other ervices as well as eliminates the need for a specially trained telex operator.

Stored on a floppy diskette, the software is compatible with microprocessors from 28 different manufacturers, including Apple Computer, Inc., IBM and Wang Laboratories, Inc. Interna-tional Record Carrier will provide compatible micros to customers without them on a free, trial basis, according to McKenna

International Record Carrier is a subsidiary of Consortium Holdings Ltd., head-quartered in Israel, which already markets Supertelex service in that country, throughout Western Europe and in Hong Kong."



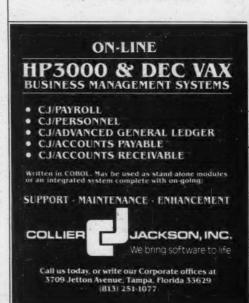
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### Afcom predicts 7% rise in '84 DP operations salaries

By Patricia Keefe CW Staff

GARDEN GROVE, Calif. — The salaries of computer operations personnel are expected to rise an average of 7% this year, with a high of 7.8% for data entry managers and a low of 6.3% for key-to-disk operators, the Association for Computer Operations Managers (Afcom) predicted in its annual salary survey.

Undermining this rosy prediction, however, was Afcom's note that the average rise in salaries during 1983 was only 3.8%, considerably less than the anticipated 7.5%. "This is a much smaller increase than was experienced [in 1982], but given the lowest inflation rate in many years, it is not inconsistent with the general economy," the survey said.

The survey, which covered 250 sites, serves as a guide to salaries currently being paid to employees at various levels within the data entry, data control and computer operations departments of the data center. It claims to be one of the few such surveys to make a distinction between the computer operations manager and the DP operations manager and the DP operations manager.

Afcom defines DP operations managers as "those who are in charge of computer operations, data entry and data control," whereas computer operations managers are responsible only for the computer room. Using Afcom's definition, there are some small shops that call their DP managers.

ers computer operations manager. "Surveys that do not make this distinction severely underestimate the highest operations management salaries and, in effect, perform a great disservice to operations," Afcom and

Anticipated increases for management personnel led the way, as they did last year, with an average of 7.5%. Other departments followed that high with estimated 7.1% increases for both computer and data processing operations, 7% for data control and 6.9% for data entry.

### Actual 1983 increase

In 1983, computer operations, by department, led the way in salary gains with an average increase of 3.5%, Afrom said. Data entry salaries rose 3.5%; bringing up the rear was data control, where overall salaries rose a miniscule .8%.

The position that showed the single largest average increase last year was DP operations scheduler, whose salary jumped 12%. Next was computer operations managers, whose salaries rose 11.3%.

On a national basis, DP operations managers earned an average annual salary of \$36,180 last year, earning 20% more a year than their counterparts in computer operations.

In large installations (those spending more than \$150,000 in equivalent monthly equipment rental costs), the DP operations manager is earning

\$42,060, and the computer operations manager is earning \$34,284. In smaller centers (under \$50,000 in equivalent monthly equipment rental costs), the DP operations manager averages \$31,320 a year, and the computer operations manager averages \$26,556.

The survey also delved into recruitment problems. The heaviest recruitment efforts targeted the computer room, where survey respondents said they encountered the most difficulty in finding qualified and experienced candidates. For example, 59% of the respondents experienced difficulty in locating qualified computer operators, while 60% found it "very difficult, if not impossible," to find qualified DP operations managers.

Conversely, there was no shortage of computer operator trainees.

Copies of the survey are available for \$10. Afcom can be reached through Data Center Management Services, Suite 201, 11501 Brookhurst, Garden Grove, Calif. 92640.

### Sting nets five alleged smugglers

MARLBORO, N.J. — U.S. Customs Service agents last week charged five people, including a Chinese citizen and an AT&T Information Systems, Inc. engineer, with plotting to smuggle high-tech equipment to China.

The five, arrested after what prosecutors claimed was one of a series of meetings with an undercover customs agent, allegedly tried to buy 100 transverse-wave tube amplifiers from the agent, who was running a "sting" operation.

Held in lieu of bails ranging from \$250,000 to \$1.5 million, the five were charged with conspiracy to export munitions illegally — specifically, \$1 million worth of Watkins-John-

son Co. amplifiers, which allegedly can be used for missile-guidance systems and for jamming radar. Assistant U.S. Attorney Andrew Ruotolo Jr. told a federal magistrate that the suspects gave the agent a "shopping list" of items that they wanted to buy and told the agent they had smuggled other goods to China.

Ruotolo said the lists included various types of computer equipment and military night scopes.

The AT&T Information Systems employee was identified as Kuang-Shin Lin of Lincroft, N.J., a naturalized American citizen. Ruotolo said Lin didn't use his AT&T position in connection with the conspiracy.

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### DP crime bills sitting on congressional back burner

WASHINGTON, D.C. - Pending federal computer crime legislation is

wintering in subcommittee this year, languishing on the congressional back burner while foreign policy and budget issues hold sway.

Four major DP crime bills are still awaiting action in the House of Representa-

tives' Judiciary Subcommit-tee on Civil and Constitutional Rights, which is chaired by Rep. Don Edwards (D-Calif.). While Edwards said at November hearings that the subcommittee would move promptly to determine if there is a need for a federal computer crime law [CW, Nov. 28], three months later no further hearings or subcommittee action is scheduled.

According to a subcommittee staff member, Edwards is still awaiting the U.S. Justice Department's recommendation on the need for legislation before moving on bills introduced by Reps. Bill Nelson (D-Fla.), Daniel A. Mica (D-Fla.) and Lawrence Coughlin (R-Pa.). The staffer said the Justice Department promised a recommendation at the subcommittee's Nov. 18 hearings, but was delayed by the recent resignation of Attorney General William French Smith.

The fifth DP crime bill, introduced by Rep. William J. Hughes (D-N.J.), is still on hold in the House Judiciary Subcommittee on Crime. A staff

member said the subcommittee, chaired by Hughes, anticipates at least one additional day of hearings on the bill, which deals primarily with credit card fraud. Though not yet formally scheduled, those hearings are expected in March.

In the Senate, no action has yet been scheduled on a federal crime bill filed last August by Sen. Paul Trible (R-Va.). That legislation — the Senate version of Rep. Nelson's DP crime bill is still awaiting initial hearings in the Senate Judiciary Subcommittee on Criminal Law.

Hearings on the Senate version of the Small Business Computer Crime Prevention Act, approved by the House in October [CW, Oct. 31], are slated to begin March 7 before the Committee on Small Business. The bill, introduced by Sen. Paul Tsongas (D-Mass.), would set up a public and private-sector task force to investigate the problem of computer crime in small business and recommend preventative measures.

Earlier this month, the Computer Crime Prevention Act of 1984 was filed by Sen. William S. Cohen (R- Maine) in response to recent Senate hearings on computer hacker activities (see story below).

If no action is taken on the stalled crime bills by Congress' Oct. 4 adjournment, the bills' sponsors will have to decide whether to reintroduce the bills in the next ses

Nelson's Federal Computer Sys-tems Protection Act of 1983 (H.R. 1092) would make computer crime a federal offense if it involved federal agencies, institutions insured by the U.S. government or computers that operate in interstate commerce. The bill, which currently has 116 co-sponsors, calls for fines of \$50,000, or up to twice the monetary gain from such a crime, and prison terms of up to five years

H.R. 4259 and H.R. 4348, both introduced by Mica, would set up a clearinghouse on federal computer

crime (see story on page 13) in addition to making it a federal offense to use a computer without authorization and with the intent to defraud or al. The bill prescribes a fine of up to \$50,000 and five years' imprison-ment. H.R. 4259 also faces review by the House Ways and Means Commit tee because it incorporates an income

tax credit for buyers of micros.

Rep. Coughlin's succinct three-paragraph H.R. 4301 would make the use of a computer in a manner not authorized by the owner a federal crime punishable by a fine of up to \$100,000 and up to 10 years' impris-

The DP crime portion of Rep. Hughes' H.R. 3570, designed to curb credit card fraud, would make the fraudulent use of a computer a federal offense punishable by a fine of up to \$10,000 and a prison term of up to

### Bill targets unauthorized access

By Jake Kirchner CW Washington Bure

WASHINGTON, D.C. -- A new computer crime bill, introduced recently in the U.S. Senate after hearings on rampant, illegal computer hacker activities, contains special

provisions to deter unauthorized acess of data base

The Computer Crime Prevention Act of 1984, proposed Feb. 8 by Sen. William S. Cohen (R-Maine), contains specific penalties for buying,

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### CRIME from page 12

procuring or selling the passwords to the computers covered in the legislation in order to obtain money or services illegally. The penalties for this offense would be \$50,000 or three times the amount obtained and/or a maximum prison sentence of five years.

of five years.

To deter computer hackers, penalties for any unauthorized access not involving fraud or damage would be up to \$5,000 and one year in jail. These would be levied only against "intentional hackers." It would "not penalize computer enthusiasts who accidentally tap into the computer systems," Cohen said.

Like other computer crime bills now under consideration in Congress, the proposed law covers computers owned or operated by the federal government and federally insured financial institutions and any system used in interstate commerce. Fines for illegally using computers for fraud, damaging computers for fraud, damaging computers or altering their content would be \$50,000 or three times the amount of any money obtained and un to five years in prison.

up to five years in prison.

Cohen noted that his Subcommittee on Oversight of Government Management held two days of hearings on hacking and computer crime last October. "Those hearings vividly illustrated that computer breakins should not be treated as simply innocent pranks by curious youngsters," he said.

### Computer crime clearinghouse proposed

A clearinghouse to identify "vulnerabilities and threats to federal computer systems" has been proposed in legislation filed by Rep. Daniel A. Mica (D-Fla.) to combat what he called the "dangerous mismanagement of federal computer resources."

Dubbed the Interagency Committee on Computer Crime and Abuse, the clearinghouse would compile and disseminate information and statistics on the incidence of computer fraud and abuse.

The clearinghouse idea was incorporated in two DP crime bills introduced by Mica last year. The bills — H.R. 4259 and H.R. 4384 — currently are awaiting action in the House, where they received only limited attention in the previous session of Congress.

The bills call for the clearing-

house to be established within the executive branch of the federal government and to be chaired by the attorney general. The interagency committee would also have as members the secretaries of commerce, defense and the treasury, the chairman of the Federal Communications. Commission and the director of the Federal Bureau of Investigation.

### Would also coordinate research

Aside from its responsibilities as a computer crime information clearinghouse for federal departments and agencies, the interagency committee would also be charged with coordinating research relating to "the development of more secure computer systems." In that function, it would make recommendations to governmental agencies for improving the security of federal

computer systems.

But perhaps its most important role would be that of making recommendations to Congress "for such legislative changes as the committee determines to be desirable in order to protect computer systems from fraud and abuse." In that role, Mica told recent hearings of the House Subcommittee on Civil and Constitutional Rights, the clearinghouse could effectively aid Congress in combating computer crime.

In addition to the proposed clearinghouse, Mica's pending legislation
calls for the creation of a Computer
Security Research Program. Administered by the secretary of commerce, the program would provide
funding to individuals for research
and development in new methods of
protecting computer systems from
unauthorized access and use.

### NCR Users Conference set for April 29-May 2

CINCINNATI — The Federation of NCR User Groups will hold the 14th annual NCR Users Conference (Nucon) at the Cincinnati Convention Center here April 29 to May 2.

The conference will include more than 60 educational sessions, including presentations on hardware, operating software, software tools, application software management techniques and communications. Also included will be an address by C.E. Exley Jr., NCR Corp.'s president and chief executive officer.

The conference fee is \$355 for participants who register prior to March 16: after that date the fee is \$395.

Further information is available from the Federation of NCR User Groups, Mail Station SDC-2, Dayton, Ohio 45479.

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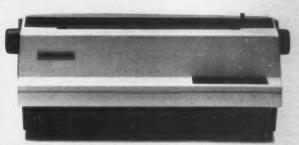
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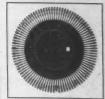
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### Decision on higher Ecom rates due Friday

By Phil Hirsch CW Washington Bureau

WASHINGTON, D.C. U.S. Postal Service's much-maligned Electronic Computer-Originated Mail (Ecom) service may get a new lease on life this Friday, when the U.S. Postal Rate Commission is scheduled to act on a proposal for higher

The proposal, submitted 10 months ago, would raise the price of a one-page Ecom age from 26 to 31 cents; two-page message, now

priced at 31 cents, would rise to 40 cents. If the new rates are adopted, according to Karen Uemoto, Ecom's director, the service will "begin to break even late next year or early in 1986," and by late 1987 there will be enough of a surplus to repay all of Ecom's accumulated deficit, which currently totals more than \$35 million

However, not everyone agrees with Uemoto's rosy forecast. Critics include the Department of Justice and Rep. Glenn English (D-Okla.), chairman of a House of Representatives government operations subcommittee, as well as vendors of competing private electronic

When Ecom began service in January 1982, postal officials predicted it would handle at least 50 million mes sages during fiscal year 1983, which ended Sept. 30. The actual volume was 15.3 million messages.

Last December, The Washington Post reported that one customer, Automotive Incentive Development Co., accounted for 50% to 75% of Ecom's total volume. company's president, James Young, was quoted as saying that if the proposed rate increase is implemented, he will stop using Ecom service.

In addition, Ecom's managers have been accused of exceeding their authority by unilaterally modifying the service. As originally conceived, Ecom was to be a "generation II" electronic offering. Messages

WASHINGTON, D.C.

We're in the same market

vice's Electronic Computer-Originated Mail (Ecom), "but

spokesman for MCI Digital

Information Services Corp.

said last week after the company unveiled MCI Volume Mail, a second-generation

Mail, a second-generation electronic message service

In both services, the user

transmits multiple messages

to a receiving center, where they are printed, enveloped

and then delivered by the

Postal Service as ordinary

that works much like Ecom.

we're offering much more,

as the U.S. Postal Ser-

MCI announces service

to compete with Ecom

would be transmitted on-line from the sender's site to a serving post office (SPO) near the recipient; each mesage would be printed at the latter point, placed in an en-velope and delivered by a letter carrier on his regular rounds. The whole trip, from sender to receiver, was supposed to take a maximum of two days.

But the Postal Service has admitted that a significant percentage of Ecom messages have not been transmitted to the "addressee SPO" for some time. Instead, these messages are transmitted by the sender only to his local post office, where they are printed out, placed in envelopes and forwarded to the recipient as ordinary airmail.

About 50% of Ecom me sages are handled in this way, according to a statement published by the Postal Service last April in the Federal Register. However, Ecom director Uemoto last week estimated that figure at between 30% and 35% of the total amount of Ecom mes-

### Cost advantage

The major advantage of this arrangement for the cus-tomer is that it saves the cost of transmission to the addressee's post office, typically amounting to about \$1 per message. The local post office transports the message. after printing and enveloping it at the sender's end, and the total charge to the sender for printing, enveloping and transport is 26 cents or 31

cents, depending on the num-

Consultant Mike Cavanagh, who is probably Ecom's most vocal critic, contended that this modification of the original Ecom service demonstrates what is wrong with the whole concept. His basic point is that the only market for Ecom is "junk mailers needing a cheap, quick distri-bution system. Since there are not enough such mailers to make the service viable, the Postal Service has simply modified Ecom to make it even cheaper.
"But there just aren't

enough customers out there even at the lower price," Cavanagh argued, "so the Postal Service's other patrons have to make up the difference between what Ecom takes in and pays out. In effect, they're paying a steadily mounting subsidy to support a handful of junk mailers."

Although Cavanagh and his fellow critics have attracted a lot of press and public support for the idea that Ecom lacks any redeem ing virtue, there is at least

one other view. According to that view, the bulk of the Postal Service's revenue comes from first-class mail; business-re lated letters supply the bulk of that revenue, and a rapidly growing profusion of one terminals threatens to reduce that revenue stream

A related argument is that, like the local telephone company, the local post office performs a unique and valuable public service; therefore, if it is desirable to subsidize the local telephone company so it can retain business customers, it is equally desirable to subsidize the post office so it can do

Critics of that argument, however, point out that unlike the local telephone company, Ecom is not a successful business venture.

The upcoming report of the Postal Rate Commission will significantly impact Ecom's future. Besides the rate increase proposal, the commission will also consider whether to let Ecom users, for an additional four cents, send a business reply envelope along with a message and whether to let users send any number of messages at one time (they must current-

ly send at least 200).

If either of these latter changes is approved, it will mark the first time a major modification of Ecom's original design has been officially

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first-class mail. MCI charges 70 cents to \$1 for a one-page letter, depend-ing on volume and job requirements. This is roughly what Ecom costs. But while Ecom requires users to send at least 200 messages at a time, MCI Volume Mail customers can send any number

of messages.

In addition, the MCI service allows business reply envelopes or other inserts to be sent along with the mes sage, accepts a wide variety message formats, reproduces company logos and features a simple sign-up proce-

The U.S. Postal Service is currently seeking authority to provide a business reply envelope as part of Ecom and to do away with the 200-message minimum.

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### Ways to bypass the phone net on the rise



One of the nation's more extensive bypass networks was put into operation last year by Citicorp, the New York-based bank ing giant. The network links 10 sites — three on the East Coast, two on the West Coast and most

of the others in the Midwest — allowing them to communicate with each other via 56K bit/sec digi-

At the other end of the bypass spectrum is a 1.544M bit/sec digital microwave channel that a company is using to connect two buildings across the street from each other. This system, according to a spokesman for M/A-COM, Inc., a leading man ufacturer of private microwave equipment, costs

Citicorp, by comparison, is paying \$24 million annually just to lease the satellite channels connecting its 10 earth stations. Each of the stations cost another \$1 million.

But in both cases, the motivation is the same to reduce communication costs below what the wire-line carriers (telephone companies that own transmission facilities) are charging for equivalent transmission capacity and/or to obtain service features not available from the carriers.

How many companies today are using services that bypass the telephone network? Because the figures come from biased sources — bypass vendors and telephone carriers — it is impossible to know accurately. The Federal Communications Commission is expected to issue a detailed analysis within the next month or so, although the commission is not universally considered unbiased.

However, it seems certain that bypassing will increase, both in terms of increasing revenues and in terms of a broadening of the types of users in-volved. Higher tariffs are a major reason. AT&T's proposed rates for private-line service, filed last

October and now scheduled to become effective April 3, call for a 15.7% overall increase in inters and transport area private-line rates. Because of the FCC's recently amended access sur-charge plan [CW, Jan. 30], this percentage is ex-

One difficulty of discussing bypass is that conflicting definitions of the term exist. It may mean going around the local-exchange network or going

ound the long-distance network — or both. And while some observers talk about bypass in terms of customers and/or traffic, others are con-cerned about costs and revenue. This semantic confusion creates problems because if a bypass facility is defined as one that provides communica-tions more cost-effectively between and among points normally served by the analog telephone etwork, then the biggest providers of bypass fa

cilities are the telephone companies themselves.

AT&T is laying fiber-optic cables down the East and West Coasts, as well as elsewhere, which will interconnect several of the nation's largest cities. Meanwhile, many former Bell operating companies are installing local as well as long-distance fiberoptic channels

The Pacific Telesis Group (Pactel) has laid three fiber-optic loops in downtown San Francisco that can put 90M bit/sec of digital transmission capacity on the doorsteps of nearby companies. In addition, Pactel has just about completed a fiber-optic network in the Los Angeles area that will interconnect the sites of the 1984 Olympics, which are scattered over an area stretching 90 miles north, 30 miles east and 110 miles south of the city. By 1986, the company expects to have all of California's major cities connected by fiber-optic cable.

Meanwhile, it has requested FCC permission to offer digital termination systems in 19 California and Nevada cities and is installing fiber subscriber loop carrier systems in several areas, which would

replace much of the existing residential and business customers' analog local loop with a fiber-optic cable that carries 24 digitized voice signals totaling 1.5M bit/sec.

Par el also has proposed constructing a CATV system to serve Palo Alto, Calif., and several surrounding communities. Part of the system's capaci-ty would be reserved for data transmission at all popular speeds

A "key alternative" to these telephone compa ny-provided facilities, according to a recent report published by the market research firm International Data Corp. (IDC), is private microwave. "Given the demand in the 1980s for multifaceted data/voice services," IDC said, "we expect to see major growth in . . . microwave-based private communication networks."

Part of this growth will be produced by digital termination systems vendors. A digital termination systems network basically consists of a centrally located microwave transceiver which communicates with users up to about eight miles away through three or four microwave antennas, each serving a different sector of the surrounding area. Users within each sector share a 1.5M bit/sec, digital, full-duplex channel. Because transmission capacity is limited, digital termination systems are generally considered feasible for interactive rather than batch-type data communications and are not suited, at least presently, for voice traffic.

More than 50 companies have requested FCC permission to build and operate digital termination systems, and such systems have been authorized for most of the nation's major cities. Although only a few are actually on the air at the moment, several are scheduled to begin operation this year, so these new bypass facilities should become accessible to a substantial percentage of the nation's corporate communications users by the end of 1984. See BYPASS page 16

### **How to Bypass Your Local Telephone Company** Major sources Types of facilities offered Comments AT&T, the former Bell operating compan The former Bell operating companies offer long-distance access (local exchange network bypass) using terrestrial analog/digital transmission facilities. Connections link user with AT&T, other common carrier All carriers making increased use of fiber-optic cable for local long-distance transmission. Many former Bell operating companies planning to introduce local-area data transport services, circuit-switched digital capabilities, local-area services, circuit-switched digital capacinues, ocia-areai networks this yeer; they may be authorized to offer digital termination systems (DTS). Some former Bell operating companies are planning to build cable TV networks providing private-line services. The former Bell operating companies are also likely to build office parks offering other tenants teleport and/or shared access to terrestrial networks. network nodes or with user's private local/longaccess and transport areas) satellite, terrestrial private-line facilities. The former Bell operating companies offer intra-Lata private-line facilities. Two telephone companies (Rochester Telephon Southern New England Telephone) are building multistate private-line networks. Long-distance access using private lines typically leased from phone company. Auxiliary services — electronic mail, private branch exchange and message centers — are also frequently available. Shared communications services are now offered by 58 office buildings concentrated in New York City, Dalias and Chicago. Telephone companies and other common carriers investing in real estate-related communications ventures Video teleconferencing to be offered this year by at least one Demo suppliers (DTS provide data-only s within metropolitan areas: digital Only one DTS carrier is operating at the moment. Several plan to be on the air by the end of this year; however, their networking capability will be limited. New technology and the opening of 18-GHz frequency band promise to increase Point-to-point, point-to-multipoint, microwave-based transmission at speeds of 9.6K bit/sec to are DTS on capacity. Long-distance bypass for voice/data communications. Some teleports also bypass local exchange networks. New York City teleport, first of its kind, scheduled to begin New York City teapport, hist of its kind, screedured to begin operation late this year. At least two more (Bay Area Teleport in San Francisco and Los Colinas office park between Dallas and Forth Worth) are likely to be operational in 1985. According to one estimate, within three years teleport-equipped office/industrial parks are likely to be operating in the nation's 30 largest metropolitan areas. "Antenna farm" teleports are now operating in about 25 cities. Cable TV-based private-line services are now offered in a number of cities — notably, New York, Pittsburgh and Omaha. They are planned in several more, but local telephone companies re insisting that the companies must first be certified by state public utilities commissions. The Federal Communications Commission has been asked to assert federal jurisdiction. Coax/fiber-optic-based private-line services connecting user on point-to-multipoint basis with local sites and/or with long-distance network nodes. Cable TV nete Primarily microwave (including DTS) providing point-to-point, point-to-multipoint transmission at all popula bit rates. Business use of microwave to bypass local exchange network is increasing. Most new systems operate in the 18- or 23-GHz range. Transmission up to 8 miles without regeneration is nossible.

### WASHINGTON UPDATE

JAKE KIRCHNER

### Japan will reconsider trade proposals: U.S.

WASHINGTON, D.C. - U.S. government officials said recently they believe Japan will reconsider several controversial high-technology trade proposals that have raised serious concern among American firms.

Chief among the U.S. complaints is a Japanese proposal to create a patent-like protection mechanism for software, allowing for only 15 years of protection and including compulsory licensing to the end user. American industry claims the proposal would allow Japan to raid U.S. software to help it catch up in this important high-technology field.

The other area of concern is a proposal to limit foreign ownership of a certain type of telecommunications network the Japanese government

may try to foster in that country. Both proposals are in the early stages, and U.S. trade officials told

U.S. industry leaders recently that Japan has agreed to consider American views as the proposals are developed. U.S. computer and electronics industry representatives who met with U.S. Commerce Secretary Mal-colm Baldridge and U.S. Trade Representative William Brock reported the government has assured them of strong support in the controversy.

### **CAB** orders regulations on reservations nets

WASHINGTON, D.C. - The Civil Aeronautics Board (CAB) has directed its staff to prepare regulations to minimize bias in the computerized airline reservations systems provided by airlines to travel agents.

The CAB decision is the latest move in the agency's investigation of complaints that some of the systems, provided by a small number of airlines, are biased in favor of the providers' own flight schedules, to the detriment of carriers who rent time on the systems

Although there are several systems providers, most travel agents use the systems developed by United

Airlines and American Airlines.
Independent studies by the CAB and the Justice Department found a potential for major abuses with anticompetitive consequences in current

systems operations.

The CAB rejected suggestions from some airlines that these systems operations be divested.

The regulations being developed by the CAB staff reportedly will include provisions to ensure all air-lines' schedules on a system are listed without preference to any carrier and that participation fees charged by the system providers to other airlines are not excessive.

### Group plans ad campaign on VDT safety, tech issues

WASHINGTON, D.C. - A newly formed Coalition on Workplace Technology is planning a major advertis-ing campaign on ergonomic and safeissues in support of increased use of office technologies

The coalition, initially concentrating on VDT safety, was formed in response to concerns that new technology is not put to its best use in the work place, according to the Computer and Business Equipment Manufacturers Association (Chema), a major force behind the coalition. The coalition will also target what it terms "unnecessary" legislation now ap-

pearing at the state level to regulate implementation and use of computerbased office equipment, particularly VDTs, said Cbema spokeswoman Charlotte LeGates.

Besides Chema, other members of the coalition, representing manufacturers and users of high-technology equipment, include the Air Transport Association of America, the American Bankers Association, the American Electronics Association, the American Insurance Association, the American Newspaper Publishers Association, the American Society of Personnel Administration, the Electronic Industries Association and the Printing Industries of America.

LeGates said the number of prospective members is three times the number of groups that have already joined the coalition. She said the group's funding level "is very much up in the air," but that a "major advertising campaign" now under con-sideration would cost a minimum of

In a statement issued last week, Coema President Vico Henriques said, "We have a great deal of information about the best installation and use of visual displays, about how to introduce new technology in the work place and about the kinds of questions and problems that users experience."

### BYPASS from page 15

According to Telestrategies, Inc., a McLean. Va., consulting firm that devotes most of its time to studying the bypass industry, digital termination systems networks in 45 cities will be operating by the end of this year. At least a few of the cities are also likely to be interconnected by then, so some users should be able to employ the new networks for long-distance as well as local communications.

Another significant source of bypass services is multitenant services vendors. A typical multitenant vendor is the owner of an office building or office park which leases communications circuits from a carrier and resells them to its tenants

According to Jerry Lucas, president of Telestrategies, Inc., 58 office buildings around the country now provide such services. It is "virtually certain," he added, "that any office building of more than 300,000 square feet built in 1985 will provide shared communication services to its ten-

Most offices with fewer than 200 employees can save six cents to 20 cents a minute per call by sharing long-distance service instead of dealing directly with the phone company, Lucas contended. And besides this direct saving, he pointed out, the sharer gains access to sophisticated prioffering electronic mail boxes, least cost routing and similar features which the sharer often cannot justify on its own.

Although multitenant service vendors typically lease terrestrial circuits, they may also use satellite facilities. Late last year, for example, Olympia & York, the largest office developer in North America, announced plans to interconnect all of its properties, located in New York and eight other cities, using satellite channels supplied by United Telecommunications, Inc., a major inde-pendent telephone company.

A related form of bypass involves "teleports." The best known of these is being built jointly by New York, the regional port authority, Merrill Lynch & Co. and Western Union. Located on Staten Island, the teleport will provide access from a single lon to 24 existing or planned do mestic and several international sat-

ellite networks.

Some of the teleport's users will be located in an adjoining "corporate park"; others will be in neighboring areas of New York and New Jersey Two similar teleports, consisting of earth stations and an adjacent office area, are also under construction.

One is in the San Francisco Bay area, the other near Dallas. The big advantage of the teleport-cum-office park is that it can largely eliminate the access circuitry — and its related - which existing carriers like Satellite Business Systems must add to their charges.

Telestrategies' Lucas expects teleports to be built in the nation's largest 30 cities within the next three years. He also expects "antenna farms" to be built in the largest five cities. Antenna farms, he explained, are satellite earth stations without office parks, connected by leased circuits to users scattered throughout a metropolitan area. Their operators would lease satellite transmission capacity at bulk rates and resell it in smaller pieces at rates less than those charged by other carriers.

### Regulatory policies

Although the economics of bypass services will have an important bearing on their viability, regulatory policies will also play an important role.

For example, although a number of CATV companies now offer data transmission services and more plan to do so, they are being stymied by telephone companies' insistence that the CATV operators must first obtain common carrier licenses. According to a survey conducted last year by Time, Inc. and reported to the FCC, eight states — New Jersey, New Mexico, New York, Oregon, California, Colorado, Connecticut and Nebraska — are investigating this.

Meanwhile, legislation is pending in Congress to free cable-based private communication services from regulation, and the FCC is considering whether to preempt state regulatory authority over cable.

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### IBM seen marketing micro with 'Trojan horse' strategy

By David Myers CW New York Bures

NEW YORK — With its antitrust worries safely behind it, IBM has developed a "Trojan horse strategy" for infiltrating American businesses with its Personal Computer and for taking over the entire hardware market through services delivered over its Information Network, The Yankee Group said at seminars held here and in San Francisco earlier this month.

IBM's aim is to "intoxicate end users with [the] limited processing power" of desktop Personal Computers, "creating an explosive demand" for storage media, software and processors, Dale Kutnick, executive director of the Boston-based consulting firm, told about 120 executives from

user and vendor firms who attended the seminar here, titled "The IBM Impact."

"IBM has settled into its role as the standard-setter for the industry," Kutnick said. Before the U.S. Justice Department dropped its antitrust case against the company, "IBM was almost paranoid about competition and felt uncomfortable with third-party software developers."

But despite its clear aim to "dominate the industry," IBM is vulnerable in office automation, he contended. It lags behind its minicomputer-making rivals in developing a \$35,000 to \$40,000 system to act as what he called "a departmental file cabinet."

"There is a desperate need for this machine. Customers are looking for a

system in the \$20,000 range. They're still looking for that magic box," Kutnick said

The rapid acceptance of the IBM Personal Computer, with 550,000 units shipped in 1983 and 1.5 million expected to be shipped in 1984, has obscured IBM's lack of a departmental-level office automation minicomputer, according to Kutnick.

### Local-area net to debut?

Until IBM is able to design a 4300 family machine "small enough to fit onto the departmental level" — a process expected to take three years — it will pursue its strategy of dominance through networking, Kutnick told the seminar attendees.

Kutnick predicted that the compa-

ny's local-area network will finally be announced in the second half of the year. A stopgap measure — a network designed for the Personal Computer — is likely to be made available at mid-year, the fruit of a joint development effort by IBM and Scitex, an Israeli firm.

"All the IBM local-area network will be is a local physical implementation" of Systems Network Architecture (SNA), Kutnick maintained. And it is through SNA and the SNA-based Information Network that IBM is plotting to conquer the computer industry, he added.

By year's and, IBM had captured a .9% share of the \$4.23 billion computer services market, according to Yankee Group estimates.

### Local net, 'Sierra' uniprocessor expected from IBM in '84

NEW YORK — Nothing as dramatic as the Personal Computer or the PCjr is expected from IBM this year, according to The Yankee Group.

Big Blue's major new product offerings this year will consist of the oft-predicted and oft-delayed localarea network as well as the project code-named Sierra, a high-end uniprocessor-based machine capable of

obeying between 14 million instructions per second (Mips) and 19 Mips, Yankee Group researchers said.

Yankee Group researchers said.

The Boston-based consultants told attendees at seminars on "The IBM Impact," held here and in San Francisco earlier this month, to expect midyear, 15% price cuts on the 3081 and 3084 systems, along with higher maintenance costs on the 3033 family.

Other announcements said to be on the way include:

■ Introduction late this year of a version of the Personal Computer, able to run subsets of System/36 op-

■ The unveiling of a Personal Computer with a built-in modem late this year or early next year.

■ The release sometime this year of an MVS-like operating system to

encourage IBM's 20,000 DOS users to sidle over to MVS.

■ Availability late this year of a Systems Network Architecture support capability for the VM operating system.

■ The marketing throughout the year of various enhancements to the Personal Computer, including a portable version, a different keyboard and a voice-input module.



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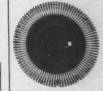
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### SDC employee charged with bribe attempt

By Patricia Keefe

ALEXANDRIA, Va. — A federal grand jury here has indicted a contract employee of Systems Development Corp. (SDC) on charges that he attempted to bribe a consultant to a Massachusetts state agency in return for help in securing an estimated \$3.4 million state contract.

The indictment, announced two weeks ago, also charges consultant M. James Errico with interstate travel in aid of racketeering and two counts of wire fraud. If convicted on all four counts, he could receive up to 25 years in jail and a \$31,000 fine. Errico has entered a plea of not guilty. The case is scheduled to go to trial March 19.

Errico is under contract with SDC to serve as both consultant and director of marketing, according to Bernard Fried, vice-president, general counsel and secretary at SDC. He said that top management is currently reviewing the case and is expected to decide soon whether to terminate Errico's contract.

"Just because someone is indicted does not mean he is guilty," Fried pointed out.

Errico is accused of promising James R. Camicia, an industrial management consultant hired by the Massachusetts Welfare Department, with future consulting work with SDC in exchange for arranging to have the state contract awarded to the firm. The contract concerned development of a system called the Massachusetts Public Assistance Control System (Mpacs), which will be used to man-

### **Groups granted DPMA charters**

PARK RIDGE, Ill. — Two new special interest groups in the areas of education and software maintenance have been granted provisional charters by the Data Processing Management Association (DPMA).

The Special Interest Group for Education will seek to enhance communication between industry and education and promote further development of the DPMA model curriculum for computer-based information system education in colleges and universities.

Officers of the group are Dr. Georgia B. Miller, president; Dr. Herbert Rebhun, vice-president; and Kathleen T. O'Neill, treasurer.

Membership information is available from Miller through Indiana University, P.O. Box 647, Indianapolis. Ind. 46223.

The Special Interest Group on Software Maintenance will deal with the problems of enhancement, modification, upgrading, adaptation, tuning and correction of existing soft-

Group officers are Dr. Ned Chapin, president; Barbara J. Taute, vice-president; and Nicholas Zvegintzov, secretary/treasurer.

Membership information is available from Zvegintzov, No. 5F, 141 St. Mark's Place, Staten Island, N.Y. 10301.

age several major welfare programs.

The alleged bribery attempt falled, and the contract was awarded to an SDC competitior, Consultec Co., last

SDC competitior, Consultec Co., last June.

According to a Welfare Department spokeswoman, the bribery attempt was reported immediately to the Massachusetts attorney general.

tempt was reported immediately to the Massachusetts attorney general, who turned the case over to federal authorities because "it involved facts beyond the jurisdiction of Massachusetts."

### **Medicald contract threatened**

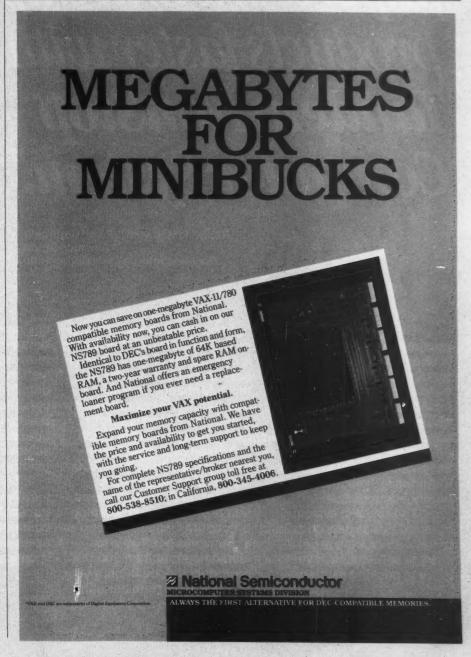
A subsidiary of Burroughs Corp., SDC was awarded in 1982 an unrelated \$40 million contract to automate Massachusetts' \$1.2 billion Medicaid program. That contract has been plagued with delays, resulting in at least two warnings from state officials to shape up or lose the contract. Repercussions from Errico's indictment could jeopardize SDC's Medicaid contract, even though that contract is separate from the one involving Mpacs.

According to Welfare Commissioner Charles M. Atkins, if Errico is convicted, the state's contract with SDC has a provision allowing the state to terminate the Medicaid contract—something it has threatened to do

twice now.

The first warning was in August in an attempt to get SDC to meet its deadline for getting the system online [CW, Aug. 22]; more recently, SDC was placed on notice that unless it reduces its backlog of processing claims to a 14-day waiting period by March 5, its contract will be canceled.

In response, SDC has filed a 25page plan to resolve its problems, including an agreement to increase its staff. Nonetheless, Welfare Department officials have estimated the Medicaid management information system has saved the state \$28 million since last September.



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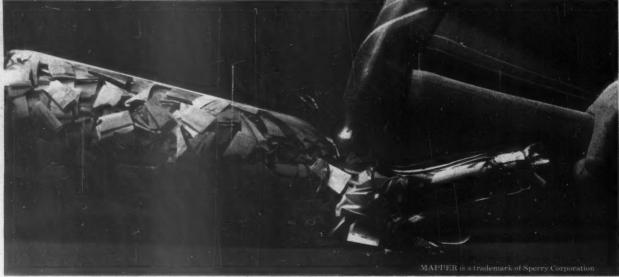


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### Scofflaws nabbed at work by printout-wielding police

INDIANAPOLIS - Armed with computer printouts, local police offi-cers struck at banks, factories and other businesses earlier this month, rounding up hundreds of people wanted on traffic tickets and other misdemeanors.

The dragnet, coordinated through a pair of IBM 3031 mainframes, featured police arresting people at their places of work. The 165 well-publi-cized arrests in the first day of the program and more arrests in the days that followed inspired 2,500 other people to appear voluntarily in court

to clear up outstanding warrants.
The 3031s combined information received from court and police data bases with information collected from another, unidentified source to determine up-to-date home and work addresses for 7,000 people wanted for misdemeanors.

"About nine months ago, we got together with the municipal courts and the prosecutors and found that we were successful in serving only one out of 25 warrants," said India-napolis Police Department Lt. David Cupello. "Eighty to 90% of the time, the address on the face of the warrant was erroneous, and even where it was accurate, we had little chance of finding the people at home. So we started using various on-line systems to update the addresses.'

To ease a backlog, officials offered a 50-day amnesty period under which 27,000 people named in out-standing Marion County misdemeanor and traffic warrants could surrender and pay their fines without risking imprisonment. Only 2,000 accepted the offer.

Meanwhile, the police and the court's 3031s, with software developed in-house, matched the names of wanted persons with places of employment and up-to-date addresses.

The source of that address information remains a secret. "We won't reveal it by agreement with those involved," said Cupello, who is also executive officer of the police depart-ment's data processing branch.

During the amnesty program, the police department mailed explanatory letters to 30 major employers to forward to workers who were be-lieved to have outstanding warrants. Those letters warned the workers they were subject to arrest when the amnesty program expired on Feb. 1.

On that date, 25 two-officer teams hit the streets, armed with printouts with names and home and work addresses for 7,000 people. They round-ed up 165 people that day. Employers often let officers use

personnel offices and summoned sus-pects there, rather than having em-ployees handcuffed at their desks,

according to Cupello.

With the publicity of the first arrests, 2,500 people voluntarily appeared in court within one week to pay fines or arrange for trials.

But all didn't run smoothly. At least one of those arrested and booked under the glare of television news crews' lights was a woman who argued that she had already paid her speeding ticket. The woman is planning a lawsuit.

Municipal Court Judge Harold Kohlmeyer interceded and barred further arrests unless the warrants were double-checked with manual files in the courthouse.

Now the officers receive updated and confirmed printouts of 100 to 200 names a day and, before making arrests, radio their dispatcher to recheck the name on the dispatcher's IBM 3270 terminal. "We suffered a temporary setback, but now we are getting lists back from the court and have some of our teams back in ac-tion," Cupello said.



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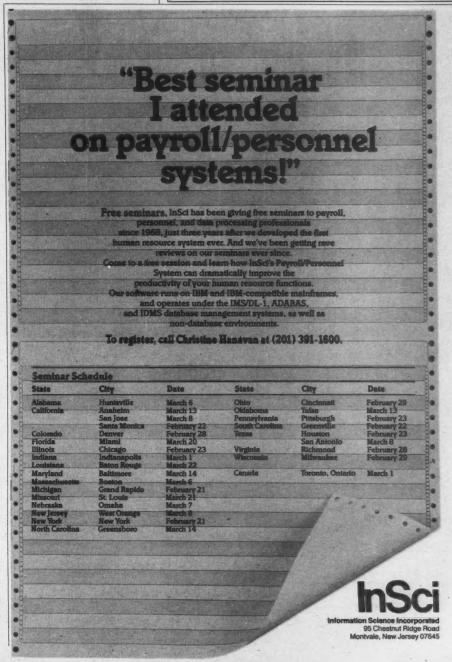
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### INTERNATIONAL REPORT

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### **AUSTRALIA**

MELBOURNE — While Telecom Australia continues to debate whether to support a second standard on its proposed videotex service, Computer Power has unveiled a videotex service that will reportedly support both the UK's Prestel system and AT&T's North American Presentation Level Protocol Syntax on the same terminal.

BRAESIDE — Labtam International Pty. Ltd. has abandoned its plan to incorporate Motorola, Inc.'s 68000 microprocessor in its three-processor system. Instead, Labtam will use National Semiconductor Corp.'s NS16032 chip in the system, which will run Q1 Corp.'s Idris as well as Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems concurrently.

### FRANCE

PARIS — OC France, a major copy machine vendor here, has become France's first user of the IBM 4361. OC's system, which replaced a 4331/ 2, includes 4M bytes of memory, six 3370 disk drives, two tapes, a line printer and two 3274 controllers. It runs under DOS/VSE, but OC is planning a conversion to MVS.

PARIS — Thomson-Brandt recently started selling Eagle Computer, Inc.'s microcomputers here under the name Micromega 16. Thomson also markets Micromega 32, a micro developed by Fortune Systems Corp.

### **JAPAN**

TOKYO — Taking aim at IBM's 4361 system, NEC Corp. has introduced the mid-range Acos 430 system. Capable of performing 1 million instructions per second, the 1G-byte NEC machine is targeted for office automation applications as well as

computer-aided design. It runs under NEC's Acos-4/AVP operating system. Options include a high-speed scientific calculation processor, an integrated array processor and a three-dimensional display. Although prices were not available, it was learned that the system rents from \$7,660/mo, about half the rental fee of a comparable IBM system.

OSAKA — Kodensha, Inc., a leading software firm here, has unveiled My Letter Korean, a word processing system for Korean users that combines 2,000 Korean characters with 2,500 Japanese characters. The product was developed for NEC Corp.'s PC-9800; the two products are currently available as a turnkey system for \$5,100.

### **NETHERLANDS**

AMSTERDAM — Oscar Data has won an initial \$10 million contract from Sweda International, Inc. to supply software for Sweda's point-of-sale cash register systems. The software order is thought to be the largest yet in the Netherlands.

### PEOPLE'S REPUBLIC OF

BEIJING — The Chinese government has ordered \$850,000 worth of microcomputers from Japan's NEC Corp. NEC will deliver 155 of its PC-8000 computers and another 150 of its more sophisticated PC-8800, which can display about 3,000 Chinese symbols and characters. The micros will be used for educational and agricultural applications.

### **UNITED KINGDOM**

LONDON — Rank Xerox appears to be well positioned to be a leader in the emerging European office automation market, according to a recent study by Frost & Sullivan Ltd. According to the study, the vendor has already distinguished itself as having an "enviable record as an innovator" with products such as Ethernet and Star. But the report also maintained that Rank Xerox must win back the small copier market it lost to the Japanese during the 1970s and hope that IBM endorses Ethernet.

### WEST GERMANY

MUNICH — IBM Deutschland GmbH and Siemens AG have signed an agreement to manufacture and market jointly storage peripherals. The contract initially calls for IBM to ship its 3380 mass storage disks to Siemens for its 7800 systems.

MUNICH — The German postal, telephone and telegraph (PTT) administration is reportedly trying to push through rate hikes for its Datex-P and Datex-L teleprocessing services. If the PTT is successful, customers will end up paying 50% to 60% more for the X.25-based service. The Ministry of Post and Telecommunications has yet to pass down an official decision.



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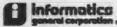
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### TURNAROUND

LARRY E. LONG

Q Our marketing people have asked us to respond to technical inquiries from three of our large customers who requested directions that would permit them to transmit orders directly from their computers to ours. This seems only logical, since the volume of transactions generated by these three customers is staggering.

tomers is staggering.
Here is the problem. My staff is already overcommitted for the next two years.
Preliminary estimates of manpower requirements for the project range from one to three man-years.

While this project would appear to be extremely costeffective and convenient for both us and our customers, surprisingly I'm not getting much pressure to move on it. Personally, I think that a consumer goods company such as ours should place this project much higher on the priorities list, but those who make these decisions disagree. What are your feelings?

A You did not send a list of your priorities, so I cannot make any relative statements, but I am certainly willing to comment on the importance of intercompany networking: Don't delay.

Before long, your small and medium-size customers will be demanding similar services. The trend is to capture data as close to the source as possible. Why not go directly to the source, that is, your customers' computer systems?

Intercompany networking is no longer a carrot that you offer your customers; it is a marketing necessity in some industries (yours included). I know that several of your competitors already offer this service. Unless you can convince top management to revise its priorities or create funds for additional resources, your company is running the risk of alienating customers and losing a share of the market.

Pro the past five years, I've had responsibility for the DP department (about 20 people). I'll be the first to admit that I've neglected it in favor of my primary responsibilities in accounting and finance.

Being in the public sector, we cannot keep up with DP salaries and, as a result, have lost most of our best people. With our current staff, our DP department is faltering.

Momentum is building to get out of the DP business and bring in a facilities management group. One such

group has proposed that they take over the entire DP operation. They said they can move into our present facility and use their software to do everything we are doing now, and do it for less than we are currently spending. Is this possible?

A Do what for less? It may be possible for the facilities management company to reduce DP costs and maintain the status quo over the

short term, but is that what you want? You are apparently not satisfied with things the way they are

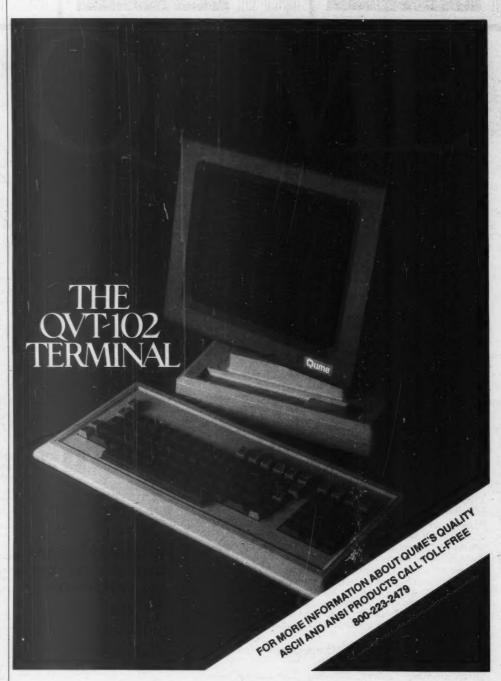
the way they are.
Implied in the company's proposal is that services over and above the existing level of service will be billed. Don't overlook this important cost consideration.

External operation of the computer center has proved a smart decision for many organizations, but not for all. You never "get out of the DP business." Top management has an ongoing responsibility to relate information needs and priorities to the DP department. Whether run by an outside company or internally, it is top management's responsibility to provide strategic direction.

I detect from your letter that you expect to be absolved of further DP responsibilities once the facilities management company takes over. It doesn't work that

way. If you continue to be aloof from DP, then don't expect any quantum leaps in the quality of the DP services.

Long, president of Long and Associates, is a consultant, lecturer and author in the field of information services. If you have a question you'd like him to address, send it to Larry Long, Editorial Department, Computerworld, P.O. Box 880, Framingham, Mass. 01701.



### Standard sign language of DP terminology created



Cursor



Scrolling

### By David Olmos CW Staff

SAN JOSE, Calif. - If Steven Jamison has his way, the nation's deaf computer pro-fessionals soon will be communicating with their man-agers and co-workers by using a new standardized sign language of DP terminol-

For the past 10 years, Jamison, a personnel consultant at IBM's Santa Teresa laboratory here, has recruited deaf college students for a summer work program con-ducted by IBM. In the course of that work, he became aware of the lack of any universal agreement on signs for computer terminology. For

example, three or four different signs are used for the word "computer" alone.

Convinced of the need for some standardized terminology, Jamison began in 1981 to compile a comprehensive glossary of DP terms in American Sign Language. IBM agreed to provide the time and money he needed to carry out the two-year project. Jamison's effort culmi-nated last year with the completion of a 600-term

glossary. Those 600 terms have been compiled in an illustrated reference book titled "Signs for Computing Ter-minology," recently pub-lished by The National Association of the Deaf in Silver Spring, Md.

Jamison and the book's publisher expect that the book will be widely used by hearing-impaired students, teachers and computer pro-fessionals. They agree, however, that its greatest potential benefit may be for DP managers and others who want to improve their communication with the deaf.

At IBM and other companies within the computer industry, many deaf persons work in technically oriented jobs, such as programming, in which the ability to hear is as critical as in other fields.

But communicating with a deaf worker can be tedious if someone has to finger spell all technical terms, Jamison said.

To compile the glossary, Jamison recruited 24 associates to serve on an advisory panel for the project. Most these volunteers were computer professionals; the majority were not only deaf but also skilled signers.

By means of mail surveys and a three-day workshop, the panelists reached agreement on which signs they preferred for all 600 DP terms. Jamison said the primary requirement for choos ing a particular sign was the likelihood of its acceptance by the deaf community.

All publishing rights for

the book have been turned over to The National Associa-tion of the Deaf, which will retain any proceeds from the book. S. Melvin Carter, director of the association's Communicative Skills Program, said the book has sold more than 2,000 copies during its first month of publication.

One company, Integrated Microcomputer Systems, Inc. of Rockville, Md., purchased 500 copies of the book for its employees and associates.

More information about More information account the book is available from The National Association of the Deaf, 814 Thayer Ave., Silver Spring, Md. 20910.

## The Price-Performance Leader.

Qume's new QVT 102. VDU terminal has all the features of the Hazeltine 1500. Lear Siegler ADM 3A/5.7 and TeleVideo 910. and emulates any of these terminals by simple menu selection. Features found in higher-priced terminals are standard, including block and conversational modes, local editing, 25th status line, menu

standard, including block and conversational modes, local editing, 25th status line, menu set-up mode, and screen content printing.

The QVT 102 takes up minimal workspace and is designed to please the operator. Its non-glare green or amber screen minimizes eye strain with a big 9 x 12 character cell. The screen tilts and swivels for perfect viewing, and the low-profile keyboard is detached to allow placement for ideal reach and hand-rest position.

Sophistication. Comfort. And affordable price. Qume's Model 102 terminaliseasily the smartest choice in its class. Features include:

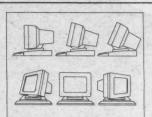
Line block, Page block, and Unprotected block transfer modes \* Four separate function keys (twelve functions) \* Line drawing graphics characters \* Til/Gwivel, non-glare, green screen (amber optional) \* 9 x 12 character cell resolution, 7 x 9 characters with a 25th status/menu set-up line \* Screen-saver time out (an inactive terminal shuts off its screen after fifteen minutes with no screen data loss) \* 5 video attributes: blink, blank, reverse video, underline, and half-intensity \* 3 emulations: Hazeltine 1500, Lear Switching power supply (efficient operation and low power consumption). and low power consu nption).

Display Format
24 lines x 80 Characters
55th status/set-up line (defeatable)
Character Formation
7 x 9 matrix in a 9 x 12 cell
Displayed Character Set
96 ASCII Characters, 15 line-drawing symbols,
and 32 control character symbols

and 34 control transcript.

Editing
Curror: up, down, left, right, and home.
Character/line insert and delete, erase to end of
line/field/page, tub, back tab, field tab, field
back tab.

back tab.
Communications Interface
EIA RS232-C, 20 mA current loop
Communication Protocols
DTR and/or X-ON/X-OFF
Communication Modes
Full or half duplex, block/line, block/page; 7 or 8
data bits



Baud Rates 16 selections from 50 to 19.2k.

Auxiliary Port
Unidirectional EIA RS232-C, partial/full screen

Screen
Tilt/swivel 12-inch diagonal standard non-glare
green (optional non-glare amber)
Character Attributes
Blink, blank, underline, reverse video, half intensity

Detachable, low-profile (home row 30mm from work surface), alphanumeric keys, 14-key numeric pad, 4 function keys (12 functions), defeatable auto-repeat and key click. Print, setup, and no scroll keys. Fields
Protected and Unprotected fields

Parity Odd, even, mark, space

Screen-saver Screen shut off after 15 minutes of inactivity with no data loss (defeatable)

Emulationa Hazeltine 1500, Lear Siegler ADM-3A/5, TeleVideo 910 Set-Up Mode Menu style, preserved in non-volatile memory

Power Requirements 95-125 VAC 200-264 VAC 50/60 Hz, 30W

Fimensions Keyboard 1.5"(H) X 18"(W) X 8"(D) Display 14"(H) X 13"(W) X 12"(D)

Weight Display 19 lbs. 2 oz., Keyboard 3 lbs.

Ottions
Amber phosphor screen
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nand Codes Cursor home Cursor right Cursor left Cursor up
Cursor down
Clear screen
Clear from cursor to end of line
Clear from cursor to end of screen
with processors Clear from cursor to end of sere with spaces Clear all foreground Line insert Line delete Keyboard unlock Bell ring Column ab Column ab Address cursor (row/column) Status line display Seatus line suppress Mentitor mode on Monitor mode on Print transparent of first transparent of first with the space of the seat of th Send line unprotected only Send page unprotected only Send line all Send page all Clear foreground to nulls Block/page on Conversational mode on Block/line on Character insert Character delete Termination character select

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### Bureau doubles output with micro-to-mini link

ATLANTA — By developing a communications package to link varied microcomputers with its minicomputers, a service bureau here doubled in a year the number of tax returns it processed for 400 accountants spread throughout five Southeastern states.

Infoservices, Inc. sought a way to provide the on-line power of its minicomputers to accountants who use more than 30 different types of microcomputers at remote locations. The company developed a software system that it said allows remote us-

ers to utilize their micros as intelligent office machines that draw on the resources of Infoservices' Prime Computer, Inc. 550 supermini and Prime 400 mini, which are being replaced by a Prime 750 supermini.

The software, known as Infocomm, is a communications programs which will run on the more than 200 microprocessors based on Digital Research, Inc.'s CP/M operating system, as well as microcomputers running under Digital Research's CP/M 86 and Microsoft, Inc.'s PC-DOS and MS-DOS, according to Infoservices Vice-President Bob Westerman.

The program permits the transmission of Ascii and binary files bi-directionally between the microprocessor and the host computer. It also provides a conversational mode whereby the microprocessor becomes a dumb terminal for routine interactive processing on the host system.

tive processing on the host system. With clients in Georgia, Florida, Alabama, Tennessee and North Carolina, Infoservices maintains four divisions: a tax division, a time-sharing service, a division that markets Infocomm and a division that sells accounting packages. A focus of the service bureau operation has been the processing and laser printing of tax forms for professional accountants.

"Users throughout the five-state region who desire to do their own data entry use more than 30 different brands of micros running under more than four different micro operating systems to greate the desired files

systems to create tax data files. "These files are then transferred to our Prime computers in Atlanta using our communications package Infocomm and the complementary program, Infohost, on the Prime. We even recreated on the micros the standard text editor available on the Prime so that our users do not have to contend with entirely different programs in their data processing work," Westerman said.

Users can process their tax returns interactively while on-line with the Prime systems. This reportedly gives them access to the greater processing power of the Prime minis and Infoservices' laser printers and access to current versions of soft-

Infoservices support personnel can answer questions on specific returns by accessing the return on the Prime via in-house terminals and can monitor the interactive process while the user is preparing a return. After completing the return, the user can print control sheets and flag the return to be printed and delivered by Infoservices

"We further capitalize on our customers' in-office computers," Westerman noted, "by providing tutorial programs that run on those microcomputers and that teach the user how to utilize our complementary system of micros and Prime."

He added that clients also use the communications system to produce financial statements and other reports, and that use of remote data entry decreases the time-sharing charges to customers who wish to have large computer power without a costly investment in hardware and software.





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### Query system allows utility to break 'language barrier'

HICKSVILLE, N.Y. — Computers can be confusing to people who don't use them every day, and part of the problem has to do with the 'language barrier" that must be overcome before most computers can be operated.

For employees of the Long Island Lighting Co. (Lilco), the public utility serving the Long Island area, computers are becoming easier to underand work with

thanks to an on-line software of all computer equipment query system that allows owned or leased by Lilco, users to interact with comcurrent employee applicaputers by using conversa-tional English terms.

Lilco runs the Intellect software system from Artificial Intelligence Corp. of Wal-tham, Mass., with IBM's CICS. teleprocessing monitor on an IBM 3033 in an MVS environment. Using Intellect, employees can access information on the complete listing tions on file and the entire fleet of customer service ve-

When users log on to the system, they are greeted by the following message draft-ed by Donald Weidman, administrator of Lilco's Office of Computer Services here: 'Good morning. Welcome to puting. We'll try to answer all the questions you pose. Don't be afraid to try.

Then, instead of relying on a complex series of commands, users draw data through Intellect with English-language commands. The system requires no programming or use of codes and imposes no requirements for structure, syntax, punctua-tion, definitions or key tion, definitions o words, Weidman said.

"It's just like talking to a person," he explained. "Suppose you wanted to know the number of applicants on file for a position in the customer relations department. By gaining access to the applicant's file and typing, 'Tell me how many people have applied for positions in customer relations, the system responds with information such as names and addresses. education, application test scores, interview dates and the other details you would need to make an initial evaluation of the applications on

Before Lilco installed the Intellect package, its data se-curity staff developed a front-end security system which requires comprehen-sive user identification, according to Weidman. In addition, Intellect's dictionary of data terms is constructed so that only users with approved security codes can gain access to the system. Once the appropriate security codes are fed into a com-puter terminal at Lilco, however, the user need only type in the questions, and Intel-lect will do the rest.

"If you aren't sure what information you would like to have," Weidman said, to have," "you only have to ask the computer, 'What information is available?' and Intellect will provide a complete list. You can continue asking questions to obtain even further details about the applicants on file, for example, or you can go on to a new subject by simply asking a dif-ferent question."

That ability to link a continuing series of questions is the key to the system's functionality, Weidman said. "In the past, users had to depend on preformatted reports, or they had to send their requests for additional infor-mation to the information systems department, which

would then generate a new report. Often, the answers to a question triggered other questions, which would also have to be answered in the time-consuming way. With Intellect, the user asks questions directly and gets an answer right away.

User response to the Intel-lect system has been encouraging, Weidman said. "It provides decision-making formation quickly. It's a

very flexible system with no rigid ground rules, and the computer dictionary can be expanded to suit the terms used by different depart-

Lilco plans to expand the use of Intellect to other corporate applications. "This type of people-friendly pro-gram will allow more people to take advantage of comput-er technology," Weidman Weidman

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### CALENDAR

### WEEK OF MARCH 11

MARCH 12-15, LAS VE-GAS — Interface '84. Contact: The Interface Group, Inc., 300 First Ave., Need-ham, Mass. 02194.

MARCH 13-16, DENVER Data Communications: Components, Systems and Networks. Contact: Institute for Advanced Technology, 6003 Executive Blvd., Rock ville, Md. 20852

MARCH 14, CHICAGO -Successful Strategies for Acquisition and Control of Microcomputers: The Revolution. Contact: Datamation Institute, Suite 415, 850 Boylston St., Chestnut Hill, ss. 02167

MARCH 14, PITTSFIELD. MASS. — Beyond 1984: Looking at Life in a High-Tech Society. Contact: Berkshire Community College, West St., Pittsfield, Mass. 01201

MARCH 14-16, LOS AN-GELES — Data Communica-tions: An Introduction to Concepts and Systems. Contact: Datapro Research Corp. 1805 Underwood Blvd., Delran, N.J. 08075

14-16, LAN-MARCH SING, MICH. - Systems Project Management. Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138.

MARCH 14-16, LAS VE-- Data Communications: Networks, Design and

tute for Advanced Technol-6003 Executive Blvd., Rockville, Md. 20852

MARCH 14-16, CHICAGO Computer Performance Measurements and Capaci-ty Terminology. Contact: Da-tapro Research Corp., 1805 Underwood Blvd., Delran,

MARCH 14-16, F LAUDERDALE, FLA. FORT Bonaventure Intercontinen Telecommunications. Contact: Gail van Tubergen, Dataquest, Inc., 1290 Ridder Park Drive, San Jose, Calif. 95131

MARCH 14-16, ARLING-TON, VA. — SAS Macro Language Course. Contact: SAS Institute, Inc., P.O. Box

8000, Cary, N.C. 27511. MARCH 14-16, MARCH 14-16, ANA-HEIM, CALIF. — The International Security Conferand Exposition. Contact: Michael Berke, Cahners Exposition Group, 12233 W. Olympic Blvd., Los Angeles, Calif. 90064. MARCH 14-16, ORLAN-

 Structured FLA. Testing. Contact: McCabe Associates, Suite 111, 5501 Twin Knolls Road, Twin Knolls Professional Park, Columbia, Md. 21045.

MARCH 14-16, CHICAGO Financial Information
 Systems — Integrating Peronal Computers. Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

MARCH 14-16, SCOTTS DALE, ARIZ. — Data Base Management. Contact: Center for Advanced Professional Education, Suite 110, 1820 Garry St., Santa Ana, Calif. 92705.

MARCH 14-16, ST. LOU-IS — Financial Management Reporting. Contact: Center

and There's More on the Way!

Optimization. Contact: Insti- for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705

MARCH 14-16, HOUS-- IMS. Contact: Center TON for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705

MARCH 14-16, WAKE-FIELD, MASS. — Local-Area Networks. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

MARCH 14-16, COLUM-BUS, OHIO -Network Communications Protocols. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. MARCH 15, ATLANTA

SDM/Structured. Contact: Mary Aliano, AGS Management Systems, 320 Wal-St., Philadelphia, Pa. 19106.

MARCH 15-16, MADI-SON, WIS. - Technology Outlook. Contact: Engineering Registration, The Wisconsin Center, 702 Langdon St., Madison, Wis. 53706.

MARCH 15-16, LOS AN-GELES — Computer Net-works: Protocols, Standards and Compatibility. Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

MARCH 15-16, PHILA-DELPHIA — Reducing Software Complexity. Contact: Infosci, Inc., Box 7117, Menlo Park, Calif. 94026.

MARCH 15-16, INGTON, D.C. — Public and Private Packet-Switched Networks — The X.25 Protocol. Contact: The George Washington University School of Engineering and Applied Sciences, Washington, D.C. 20052.

MARCH 15-17, HOLLY-WOOD, FLA. — SAS Basic Course, SAS Processing Course, Course, SAS Computer Per formance Evaluation and Macro . Language Course. Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

MARCH 16, NEW YORK Legal Aspects of the Software Acquisition. Contact: The American Institute for Professional Education, Carnegie Building, 100 Kings Road, Madison, N.J. 07940. Also being held March 23 in Chicago and March 30 in Bos-

MARCH 16, SAN FRAN-CISCO — Planning for Extended Architecture: An Unbiased Analysis. Contact: Techtran, 72 Cummings Point Road, P.O. Box 10212, 72 Cummings Stamford, Conn. 06904.

### WEEK OF MARCH 18

MARCH 18 and 20, BAL-TIMORE — 1984 Telecommunications Seminar. Contact: Alex Brown & Sons. Inc., 135 Baltimore St., Baltimore. Md. 21202.

MARCH 18-22, ORLAN-DO, FLA. - The 10th American Institute of Aeronau-tics and Astronautics tics and Astronautics (AIAA) Communications Satellite Systems Conference. Contact: AIAA Communications Satellite Systems Conference, 1633 Broadway,

New York, N.Y. 10019. MARCH 18-22, RIYADH, SAUDI ARABIA — Saudi Computer 1984 — The Business Computer Show. Contact: Philip Jenkinson, Saudi Computer 1984, Overseas Exhibition Services Ltd., 11 Manchester Sq., London

WIM 5AB, England.
MARCH 19, ORLANDO,
FLA. — Software Configuration Management I. Contact: Institute of Electrical and Electronics Engineers Computer Society, P.O. Box Silver Spring, Md. 20901

MARCH 19, ORLANDO. FLA. — Ada. Contact: Insti-tute of Electrical and Electronics Engineers Computer Society, P.O. Box 639, Silver Spring, Md. 20901. MARCH 19-20, SANTA

CLARA, CALIF. — Manufacturing Control for Top - Manu-Management, Contact: Management Education Department, American Electronics Association, P.O. Box 10045. Palo Alto, Calif. 94303

MARCH 19-20, HART-FORD, CONN. — Computer System Security Management. Contact: Center for Advanced Professional Eduation, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705. Also being held March 21-22 in Wakefield, Mass

MARCH 19-20, LOWELL, MASS. — Integrating the Information Workshop: The Key to Productivity. Con-tact: ACM Northeast Region-

al Conference, P.O. Box 499, Sharon, Mass. 02067.

MARCH 19-20, ORLAN-DO, FLA. — Dbase II. Contact: Center for Advanced Professional Education, Suite 110, 1820 E. Garry St., Santa Ana, Calif. 92705.

MARCH 19-20, SAN FRANCISCO — Managing Computer Projects. Contact: Battelle, 4000 N.E. 41st St., P.O. Box C-5393, Seattle, Wash. 98105. Also being held March 22-23 in Detroit.

MARCH 19-21, LOS AN-GELES — Personal Comput-ers in Business: The Micro-Connection. Mainframe Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

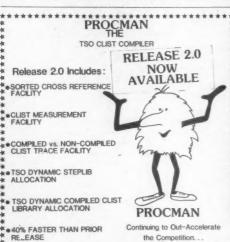
MARCH 19-21, BOSTON American Management
 Associations (AMA) 55th Annual Human Resources Conference: Innovation in a Changing Environment. Contact: AMA, 135 W, 50th St., New York, N.Y. 10020.

MARCH 19-21, SAN FRANCISCO — Power of Personal Computers. Contact: The Institute for Professional Education, Suite 303. 1515 N. Court House Road, Arlington, Va. 22201. MARCH 19-21,

WASH-INGTON, D.C. — Configura-tion Management of Soft-ware Programs. Contact: The George Washington Uni-Washington, versity,

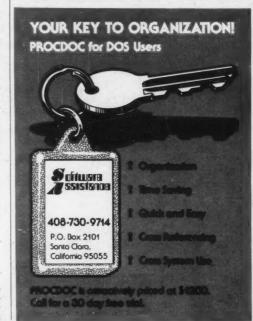
MARCH 19-21, NEW YORK — Project Manage-ment: A Practical Approach. Contact: Datapro Research Corp., 1805 Underwood Corp., 1805 Underwood Blvd., Delran, N.J. 08075. MARCH 19-22, NEW

MARCH 19-22, NEW YORK — CICS/Design. Con-tact: Comped Technical 21st St., New 10 E. York, N.Y. 10010. Also being held March 26-29 in Dallas.



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### Info users to meet March 4-8

SAN DIEGO - The Info Users Group, comprised of users of Henco Software, Inc. products, will hold its third annual national meeting at the Hotel del Coronado here March 4-8.

The keynote speaker will be John Kirkley, executive editor of *Datamation* magazine, who will speak on "The Changing Information Envi-Within a Corporaronment

Other speakers will include Henco President Henry T. Cochran, users of Henco products and representatives from Harris Corp., Prime Computer, Inc., Digital Equipment Corp. and Honeywell, Inc.

The registration fee is \$265, which can be paid at the door or sent to R2 Computer Systems, Inc., 5533 Ruffin Road, San Diego, Calif. 92123.

### Dates set for Mumps seminars

**BOSTON** — Seminars for both programmers and nonprogrammers interested in learning more about the Mumps language will be held by the Mumps Users Group at the Sheraton Boston Hotel here March 5-6.

nonprogrammers, there is "Introductory ANS Mumps Programming" March 5 and "File Manager" the following day. For program-mers, there is "Development and Maintenance of Effective Mumps Applications" on March 5 and an advanced version of "File Manager" March 6.

Seminar tuition is \$120. Registration information is available from the Mumps Users Group, Suite 308, 4321 Hartwick Road, College Park, Md. 20740.



'I don't get it. This week is aimost over and nobody's come out with a new personal

### N.Y. conference to examine micro strategies

ence on developing and implementing microcomputer strategy and policy will be held March 1 at the Park Lane Hotel here. Called "Microcomputers: High Performance/High Payoff," it will explore methods for enhance ing organizational performance through the use of mi-

Sponsored by Micro Main-frame, Inc. and Morris Deci-sion Systems, Inc., the conference will feature as speakers Peter G.W. Keen, speakers reter G.W. Keen, conference chairman and chairman of Micro Mainframe; Anthony P. Morris, president of Morris Decision Systems; and Thomas W. Johnson, vice-president for information systems, State Street Bank.

The conference will fea ture a panel discussion by microcomputer users as well as a round table discussion on the subject of "Microcomputer Opportunities and Challenges."

Also speaking will be rep-

Express Co.; Michelin Tire; Hartford Insurance Group; Sun Co., Inc.; Touche Ross & Co.: and the Internal Revenue Service.

The registration fee is \$395 per person. More information is available from Micro Mainframe, 215 First St., Cambridge, Mass. 02142.

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### TORIA

### Logic resting in the illogic

The logic rested in the illogic, and the decision of Nissan Motor Manufacturing Corp. U.S.A. to combine its information systems operations with its purchasing department [CW, Feb. 13] is a reminder that businesses may do well to take a second look - in some cases, a first look — at the unorthodox.

Nissan could have followed the well-worn path of other automated manufacturers and buried its computer and communications systems in the finance or production departments. But it didn't, theorizing that computer personnel and equipment in those departments some times have been victimized by the whims of noncomputer-oriented department heads who feel, at least in their own minds, that they most need the information systems' resources.

Instead, Nissan paired information systems with purchasing, a department that places minimal demand on those systems. The logic, according to Vice-President for Purchasing and Information Systems Robert A. Frinier, rests in Nissan's belief that information systems should be managed by executives who will not mold them to favor the parent depart-

Frinier, who admits that he is learning fast what computers are about, said the move was made to sidestep the "bias" that might occur when someone like a vice-president of finance or vice-president of production shapes information systems to his own department's bene fit and to the detriment of others who need the computer resources. Nissan hopes that the setup will provide all departments with fair access to the information systems.

Time will judge whether Nissan's reorganization works. It might indeed "knock the computer industry on its ear," as Frinier suggested with a smile. Or it might not; unfortunately, management decisions don't carry money-back guarantees. However, Nissan's decision carries a noteworthy message: Even the farfetched is worth considering.

The business world, particularly the computer-related aspect of it, will never stop evolving. At the heart of that evolution is the conviction that if something doesn't work right, it's worth trying something new.



You know how the president feels about fat in the budget

### **LETTERS TO THE EDITOR**

### Clearing up some issues concerning data processing in Nicaragua

I wish to clarify certain editorial comments that were added to the text of my article on Nicaragua "Nicaraguan DP managers face special ills" [CW, Jan. 23]. I spent two weeks in Nicaragua working in data processing. On the basis of my observa-

tions, I take issue with the following:

There is a reference to "war-torn Nicaragua." Although Central Intelligence Agency-financed "Contras" regularly attack along the sparcely populated border with Honduras, Nicaragua is not at war. Nor is it war-torn.

■ In the article, reference is made to a "Marxist regime." The Sandinista government is certainly socialist, but it also supports and encourages free enterprise. The economy is "mixed," not "upside-

A "lack of state-of-the-art technology" is

mentioned. Developing countries do not need state of-the-art technology; they need appropriate technology. An example of this is a pest-control system that runs on a microcomputer that was recently developed by American programmers in Nicara-

I could go on, but the point of my article is that in Nicaragua, programmers are expected to see themselves not as the technological elite, but as active participants in a revolutionary process. The problem facing DP managers is that many experienced programmers and analysts have left for higher paying jobs abroad.

The professionals who have remained, like Erick Brenes, director of data processing at the Central Bank, are deeply committed to the Sandinista movement. For them, computers are tools for increasing production and services. The problem of political apathy among young programmers as very real for them, for if these programmers are not motivated by a desire to help their fellow countrymen they, too, may leave. This is not a case of "government pressure to fight for the country's Marxist regime." Nor is Nicaragua "one of the world's least desirable places for computer professionals," as attested to by the growing number of American programmers and consultants now working there.

Barbara Schaffer Berkeley, Calif.

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### DP field in Nicaragua limited by economy, decades of larceny

While Barbara Schaffer's article "Nicaraguan DP managers face special ills" [CW, Jan. 23] conveys a sense of the limitations of data processing employment in Nicaragua, the essential context in which it takes place is missing.

Even under the best of circumstances, professional work in the data processing field in that country would still be limited: The economy is overwhelmingly poor and agricultural, and decades of larceny by Nicaragua's former leaders did nothing to develop the human resources needed

nothing to develop and for a healthy economy.

Today, data processing in Nicaragua must also contend with a U.S. boycott affecting new and spare computer parts, among other crucial imContinued on page 35

# VIEWPOINT

# Tweedledum vs. Tweedledee

LECHT ON SCIENCE

CHARLES P

My purpose is not to judge the merits of allowing an American computer look-alike industry to function. The fact that it is here and has been for a long time means that our various watchdog and regulatory agencies are comfortable with its efficacy and are reasonably confident

that they can handle the unique problems associat-

But the increasing number of litigation-bound cases we read about wherein the charge of copying figures as the central issue is rather unsettling. The very existence of such allegations lessens our enthusiasm to consider a look-alike manufactur-er's wares for purchase because of our fear that the companies that make them may be in for trouble. Too much success may, paradoxically, guaran-

Look-alike lawsuits, as you can imagine, involve a wide variety of copying and/or just plain lifting charges. These include the gross no-no's of blatant ly replicating another company's logo and affixing it to a shamelessly manufactured version of its patented products or distributing, without permission, outright duplicates of someone else's proprietary and copyrighted work to augment otherwise original developments.

The battleground between "look-alikers" and "real-thingers" seems hottest, for the moment, in the area of software. The kind of event reported in the article "Taiwan court sentences six for 'bad Apple' [CW, Feb. 6.], in which six Taiwanese computer executives were sent to eight-month prison terms each for copyright and patent infringement of Apple Computer, Inc. software, lets us know how serious world resolve has become to stop pirating in our industry. The previous week's coverage of IBM's victory against two companies who, according to *The Wall Street Journal*, were violating copyright law by offering an IBM Personal Computer look-alike along with IBM software from the real thing confirms this; however we may be inclined to sympathize with little guys trying to make a buck, we cannot condone their doing so with other people's property.

We can, of course, truly sympathize with honest look-alikers, those whose products confirm cur-rent legal opinion on how they must behave. Even if they fully adhere to the letter of the law, it is clearly still dangerous to create a truly compatible product. Not only do you have to survive the supreme tests of software and user program transferability between their tweedledee and your tweedledum, but if you do it too well, the likeli-hood is that a larger test is in store: survival in court against the manufacturer whose system you

so admired that you made one in its image.

Thus, as you can imagine, life for the look-alike manufacturer isn't easy. Only the toughest can survive its pitfalls. Each successful product can expect to be subject to the closest scrutiny of a chorus of attack lawyers clamoring to contest that you copied it. To minimize the possibility of a truly unfavorable legal outcome, corporations building look-alikes may be well-advised to build, as well, their judicial pleas for innocence, if charged, and ineptitude, if convicted.

While each such manufacturer must surely devise a strategy in its own image, it is always prudent to see what others are up to before building anything. So without further ado, I offer the fol-lowing as a sample of what's going on and a smidgeon of what's possible. Because of the possibility that this sampler may be seen as an attack on the practices of certain specific companies by their ever-alert attack lawyers, I wisely present it under the guise of advice.

First of all, don't make the look-alike system ourself. Assemble it if you must, but for the Lord's sake, don't make anything. Subcontract the entire system so that if by accident your look-alike turns out to be the real thing, your hands are kind of clean. Potential subcontractors should clearly include those already making the real thing for its manufacturer; subcontracting seems to be in vogue these days, so finding them shouldn't be too difficult. I advise the chosen subcontractors to, in turn, subcontract the look-alike manufacturer's work to eligible myopic components companies that know little more than how to deliver their products and that ask no questions.

Now that you've established your manufactur-ing plans, it's time to bring your look-alike to market. First, boldly take out full-page ads every-where. The more the better. Show for six months two identical bananas side by side, but provide no text. Next, test the climate for introduction of your product as a hesitant swimmer tests the water temperature with his toe. A trade show, like the Consumer Electronics show, is best for this purpose because you can make a gigantic splash with-out actually "demoing" anything. A smart give-away should generate enough excitement to bedazzle booth attendees. I suggest a mirror on

which is inscribed in bananas "My look-alike and me," suitable for boardroom or boudoir. Employ the Dallas Cowgirls to pass out banana buttons and do so as near to the real-thing manufacturer's booth as you can get. If the Cowgirls aren't tackled by a team of attack lawyers, you're getting close to

a safe introduction of your real thing.

Call a press conference to reveal the banana mystery. When the press is assembled, have a Cowgirl roll a gigantic banana — a zipper running along its length — out on the conference room floor, then slowly unzip it, letting an apple — preferably a mackintosh — plop to her feet. Check faces for outraged litigious looks while she shoves the apple back in its skin and, with a Cheshire cat grin, rezips the banana.

Your secret is out. Now there's no turning back: Honest look-alike or not, prepare for war. Immediately confuse any lurking enemy by engaging in guerrilla tactics for as long as necessary. Have Chiquita Banana's granddaughter rush out to the press and apologize for all bananas everywhere. Have a kid dressed as a peanut start to squall. Next bring in an Eve to give Adam yet another apple to bite. Have an eagle swoop down to peck at the squalling peanut. Have a midget with a slingshot end the action by killing the eagle with an acorn. You get the idea.

This is the moment of truth: the demo. Quickly and quietly slip Macrosoft-DOS into the computer — preferably a real thing camouflaged to look like look-alike you're announcing. If everything works out, your product is in the clear, and you're ready to try your hand at real commercial success.

If not, get the hell out as soon as possible. Retain F. Lee Bailey. Make a donation to John Glenn's campaign to establish your astronomical innocence. Disavow any connection with your product. Act like a Silicon Valley millionaire tired of creep-ing socialism and the mealybugs spreading it in shington, D.C., and dedicate yourself to fight for America's return to the principle of the freest of enterprises - the liberty to produce anything at anytime by anyone, no matter who owns it. Go on TV and demand this — or death.

All right, all right - you may think these practices I advise to be excessive. But after all, warding off attack lawyers isn't easy. Oh, by the way, any thing, word or idea in my "advice" that suggests an actual firm or product, living or dead, is purely coincidental.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

# LETTERS TO THE EDITOR

ports. And then there is the impact of the war being waged on the country by the large U.S.-fi-nanced "Contra" army in Honduras. This, perhaps, is what makes it what the author

calls "one of the least desirable places for computer professionals.

Nicaraguan programmers and other DP personnel cannot in the near future live a technology be-yond their means, but they can make substantial contributions that can palpably improve economic performance and the standards of living. They can, as essential human resources, also participate in such trends as the "innovators movement."

Employees recognized by their peers as contributing new tools, processes or solutions receive government support in the way of access to shops, research facilities or special education with which to develop their ideas.

Needless to say, computer professionals here can influence policies that will enhance peaceful opportunities for their Nicaraguan counterparts.

Ramon Bueno Senior programmer Somerville, Mass.

# Some more 'reasonable' ideas for marketing personal computers

I would like to comment on Jack Stone's article "Where are the knowledgeable micro retailers?" [CW, Jan. 30]. For some time now, Stone has recounted his "frustration, anxiety, depression and irritation with personal computer retailers." Apparently, Stone has convinced himself that all of his ideas for interfacing computers are rational and reasonable.

So now Stone wants to dump his random-access memory into a cassette recorder and load the data into his Processor Technology Sol 20 host. Never mind the fact that even Byte magazine has not had an ad for a Sol 20 for several years; any self-respecting dealer should stop training his service technicians and salesmen on current computers and focus on the good old Sol 20. Boy, my local dealer would love that. Why, I bet that the closest Sol 20 owner to Iowa is probably in Texas.

And a cassette dump. Wow! Of all of the personal computers that are sold in this area, I bet that there must be one or two with cassette interfaces

in this day and age.

Now that Stone has settled on a spiral notebook and three pens, let us focus on his other needs for his trips abroad. First, we'll need a vehicle able to travel in the Sahara under high noon and to roam Antarctica during the winter. It must be able to fold up into a suitcase and fit under an airline seat, but it must be able to pull three tractor trailers filled with clothes, dime novels and back issues of Computerworld. Let's see, each ball-point pen should be capable of automatically erasing simply by aiming at the offending errors and rubbing the pen between the fingers. Not state of the art, but it ould be quaint enough.

The notebook should be able to make duplicate copies of itself by being placed under a pillow at night. For two copies, use two pillows, four copies, four pillows and so on.

I hope that these ideas will help Stone in his trips around the world. Certainly, my ideas are as reasonable in today's high-tech world as Stone's ideas of how personal computers ought to be mar-

Fairfield, lowa

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# VIEWPOINT

#### LETTER TO THE EDITOR

# Caricature of user needs redrawing

In Jack Stone's article, "User emancipation from Big DP Brother: 1984" (CW, Dec. 26/Jan. 2], Stone is, of course, writing for an audience of DPers. But I feel he is being insensitive to the needs and aims of users.

Stone has caricatured a user as a DP ignoramus whose only objective is to "get control over the data processing establishment." He speaks as if users view DP as an end in itself and as if users "demand... support of computing machines, software, documentation, training and supplies" only to frustrate the DP manager. And though users always have a lot to learn about DP, I doubt if they have to be "straightened out."

What I don't think Stone realizes is that users are not trying to use their microcomputers to replace the DP establishment, but to supplement it. Micros are sophisticated tools that can quickly return dividends of increased productivity. There will be problems of data compatibility and a proliferation of data bases, but one must remember that these data bases are out there anyway, manually, though they are called ledgers, indexes, reports or lists—not data bases.

A clerk now using an electronic spreadsheet is doing the same job as he had been doing manually only now he is doing it faster and more accurately. A manager who develops a data base management system application on a microcomputer to handle a few thousand records is doing no more than his staff did before with index cards and fille boxes, but is now doing it faster, cheaper and more accurately. In both cases, it would have been inefficient to have the DP department to have the DP department develop applications on the

mainframe.

I am sure that the picture painted by Stone in his article is true somewhere, but I think it's the exception. Though there are some users resistant to learning data processing terminology, most try to understand as best they can. Their interests will always be, though, in the ends, not the means. As far as getting "answers to their trivial technical questions in the documentation" and "not ... pestering the DP department," maybe Stone should offer a course in computerese; it is normally the manual not being aimed properly at its intended uses, not the intelligence or diligence of the user that is at fault.

user, that is at fault.

It is time that we stop talking about the user vs. the DP

establishment and start talking about how users working with the micro hardware and accompanying software can, with the help of the DP department, reach a company's goals. It is the elimination of the waste of human resources doing tedious tasks manually that the use of micros can alleviate that should consume one's efforts.

Donald E. Standford

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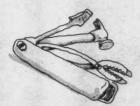
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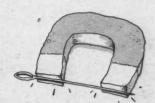
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#### VIEWPOINT

# How new micro users convert to DP faith

HUMAN

JACK STONE

It is almost eerie consistent how the conversion process is by first-time which personal computer users shuck off their numbing ig-

norance of the technology and fly high the banner of computerism.

I thought it useful to share some empirically derived thoughts about this subject in the hope that an increased awareness of such transitions will help your dealings with the user establishment.

Here are the stages of the process

that I have identified:

■ Stage 1: Wonderment. Many industry followers suggest that a large number of new users suffer violent nental agonies — cyberphobia — as they begin to approach the subject of automation, with the obvious implication that systems analysts or trainers require near-Freudian capabilities to deal with such users. I believe that the number of new users with deep-rooted psychological problems with computers is very small, in spite of all the media hype to the contrary.

I think the situation is much less complex: The vast majority simply wonder how automation will improve their lot in life and, given the opportunity to become users, whether they will do well and perform well on the job. The psychological situation is not terribly different from that which results from other major changes in one's career, such as obtaining one's first job or becoming a manager for the first time.

However, users are psychological-ly vulnerable during this period and are unduly influenced by what they experience. Machine breakdowns, boring instruction, abstruse systems documentation and irrelevant applications tend to lessen confidence in users' abilities to cope and interest in

moving ahead. It's most important that new users work with soundly designed systems in this stage, other wise their desires to pursue an auto-mation program will diminish, and their dealings with the DP community will be strained.

■ Stage 2: Enlightenment. As a sometime trainer of users, it is no less than a thrilling event when my students succeed at the simplest of DP chores, like printing out their first word processing documents or observing the results on the monitor from their first data base queries. Expressions like "This is fantastic!" and "I can't believe it!" permeate the classroom and give a terrific boost to all the students, giving rise to stronger beliefs in themselves and their expectations of meeting the training

For this and other reasons, I believe that the early phases of user training, both in the classroom and on the job, should emphasize personal achievement and not notions of fancy advanced technology. In literacy training, the impact on the student of presentations of highfalutin advanced technology — like movies of global command and control systems is negligible compared with the victory of a first-time paragraph move during a hands-on word processing exercise. For this purpose, the personal computer is ideal, be-cause it provides a total systems environment under complete control of the student.

■ Stage 3: Achievement. The conversion process is complete when new users see output that directly relates to their jobs pour out of a ma-- power on the premises, as it were. They are exhilarated, if not heady, by the obvious productivity gains inherent in well-designed systems, and many are positively giddy about prospects for the future. Continuing achievements lead to a growing systems "maturity" and indepen-

However, for some users, this re-sults in misplaced beliefs that they can do completely without the data processing department. For this reason, at some point during this stage, DPers should step in with a program seminar, briefing, whatever bring users into the arena of production systems, sobering them up with notions that they never considered before and steering the user maturation process toward more realistic goals

Letters to Stone should be addressed to him at P.O. Box 33699, Washington, D.C. 20033.



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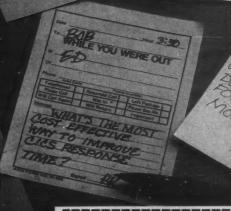
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### VIEWPOINT

# Mid-range computer market here to stay



Regarding Charles P. Lecht's article computer indus 1984 try: [CW, Jan. 9], I

think Lecht's crystal ball needs some Windex. Perhaps the following considerations will help.

Concerning supercom puters, current designs are not "really high-powered stuff," which is why the market for such devices remains relatively small: Most installations are unable to make cost-effective use of array processing architectures. What is needed in most superlarge installations are parallel architectures that are not dependent upon data homogeneity. We will see more solutions to this: The marketplace demands However, they may not look very much like supercomputers; they may, in fact, look very distributed data processing-like.

The mid-range computer market is very definitely here to stay. Corporate users want to model all their business activities in their information systems. One particularly effective way of doing that is to provide appropriate information processing power at each corporate level. As long as vendors can provide cost-effective mid-range machines, users will find many places in their organizations where they can be put to profitable use.

It is not that "the advantages of centralized data pro-cessing will be rediscov-ered," since we never lost sight of them. What is true is that we have not yet paid enough attention to the advantages of making form follow function and making capacities match responsibil-

I sincerely doubt that we will end up with a world in which anything less than a mainframe will eventually "metamorphosize into the dumbest terminals possible." Instead, I see an ever-expanding profusion of novel devices designed to solve various aspects of the problem of getting computers to communicate with people on mutually agreeable terms.

#### Here to stay

Anyone who says that programming is going to disappear betrays a lack of understanding of what pro-gramming is all about. Programming is the art of finding a solution to a problem by effectively applying whatever tools are available. As long as there are problems to be solved and tools to solve them; programming is here to

The question to be asked "Who can best program

the solution to a particular problem?" The answer is that a solution requires:

A clear, urgent, experiential understanding of the problem.

Familiarity with the capabilities of the tools.

An adequate distribu-

tion/implementation/support system.

It may well be that no single organization has the three requisites to solve the problem, in which case a cooperative agreement must be worked out. Since the motivation for solving the problem ultimately rests on the one experiencing the problem, my suggestion is that users become more aggressive

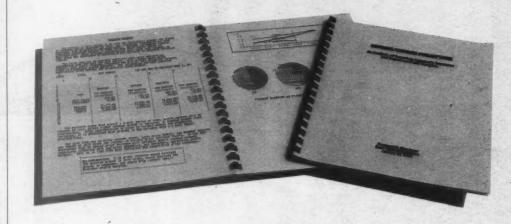
in actively creating such agreements with vendors.

I agree that users do not want to reprogram a problem that has already been solved. But they will be forced to as long as they rely upon inhouse software development. This appears necessary in the current environment because independent software

vendors as a group do not manifest adequate stability. The reason for this is that copyright, patent and tradesecret laws remain ambiguous with respect to software. The software industry's growth will remain stunted and deformed until its product is adequately protected.

The issue of the use of nat-

# NEW FROM CINCOM



# VIEWPOINT

ural language to communicate with computers is an extremely complex one, because the communication process is one of the most difficult tasks people must perform daily.

We do it so often we take it for granted, but with computers we cannot.

I would characterize communication as a trial-and-error process in which the sender of a message attempts:

To identify the audience.

■ To attract the attention of the audience.

■ To instill curiosity in the audience, making it receptive to the message.

■ To transmit his message using a syntax and vocabulary understandable to the audience.

■ To test if the message was correctly received and is being acted upon.

Since communication

problems manifest themselves in decidedly different ways in computers vis-a-vis people, it is not at all obvious that we want to communicate with them in the same casual manner that we communicate with people. In fact, even among people, we often restrict the communication process to minimize ambiguity (for example, printed forms, style and size restrictions on memos, contracts in writing and so on). I am not saying that we will not continue to make computer interfaces more English-like and to use dialogs where appropriate, including vocal input and response units. What I am saying is that language restrictions are inherent in the communications process and will never go away; not in 1984, not ever.

Any discussion of computer interfaces in 1984 and beyond would be grossly incomplete without mentioning that the use of menus and windows in combination with various pointing devices will continue to prove to be extremely popular and cost-effective in many computer interface designs. Graphics will also increase in popularity as costs diminish and interfaces become more convenient.

Putting things in perspective, I would have to say that there will never be a time when Cobol will go away, to be replaced by apparently unrestricted English. We will continue to want a rich interface environment in which programming languages and natural-looking query and command languages will each have a small but significant part.

#### Lobbying efforts

I strongly disagree with Lecht that the thrust of lobbying efforts by American electronics companies is or will be "to prevent the sale of Japanese electronics in the U.S." Instead, I see the thrust of lobbying actively as being to arrange appropriate financial and legal support for advanced basic electronics research in this country.

What could we possibly

What could we possibly gain from preventing Japanese sales here? The market is a global one, and restrictive U.S. laws cannot hope to do anything but remove the U.S. from participation in it. (If I want to buy Japanese components and U.S. law says I cannot, then I will buy them in Hong Kong, Singapore or Taiwan and move my assembly operation there.)

I think Lecht needs to get out of his think tank a little more often and see what real users' real problems are and what real vendors are really doing to address those problems. As IBM has proven for years, users are not impressed with the latest technology; they want their problems solved. When in doubt, seeing things from a more global perspective practically always enhances clarity. 3

Wallis is advisory software engineer, software development, at National Advanced Systems in Mountain View, Calif.

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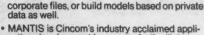
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# Will Teradata revive a market?

Just when many softready to perform last rites over the data base machine market, Teradata Corp. sur-

PAUL GILLIN prised us last month by announcing a large-scale data base machine capable of handling trillion-byte data bases speeds of up to 409 million instruction per sec (Mips). In an unusual departure from tradition, the company also an-nounced that it had already installed about a dozen of its DBC/1012 machines

in large DP shops.

The announcement will, no doubt, enliven the discussion that has persisted for the last three years about the viability of this intriguing, but so far unpopular technology. Since Britton Lee, Inc. announced the first commercially available dedicated data base processor in 1980, only a few vendors have ventured into the market. With the exception of Intel Corp., none of them are household

Vendors are understandably skittish about IBM's unpredictable pricing policies and improvements in hardware price/performance in general. In the scale data base machine market, 'hardware cost won't be a factor. The important thing will be the performance of the relational model data base," said Vincent Rauzino, manager of new product development at Data Decisions, Inc. in Cherry Hill, N.J.

IBM made that distinction clear last year when it announced DB2, its relational data base management system (DBMS) for IBM MVS installations. DB2 works as an adjunct to IBM's IMS DBMS and requires a copy of the production data. The implicit message was that large shops will be willing to pay the hardware price in order simply to get data to their users in a usable fashion.

However, Teradata appears to have covered many of the criticisms leveled at data base machines. The company has

See DBMS page 48

# University launches 'Turing'

Language boasts modular programming techniques

By John Gallant CW Staff

TORONTO - A member of a University of Toronto research team that recently developed a new general-purpose programming language may one day be a very wealthy man.

"Sure, I might get rich," Richard Holt laughed. "I think we stand to make a great deal of money from this. But we try to think of ourselves like Beethoven enriching the world with his music rather than

like Mick Jagger just making money."

Chairman of the university's Computer Systems Research Group, Holt joined forces in 1982 with fellow computer science professors Jim Cordy and J.N.P. Hume to develop the Turing computer lan-guage, named in honor of British math-ematician and computer theorist Alan Turing. The Turing language, according to Holt, is simpler than Basic, more powerful and elegant than either Pascal or PL/I and offers debugging, portability and modular programming capabilities that outstrip all

Turing was born out of an intensive one-year development effort and is cur-rently being used and studied by some

3.000 University of Toronto computer sciice students. A textbook on the language is being marketed through the Association for Computing Machinery, according to

The Computer Systems Research Group last month began marketing a Turing compiler for Digital Equipment Corp.'s VAX-11 superminis under Version 4.2 of Unix. Compilers for IBM 370 processors and the IBM Personal Computer are slated for re-lease in the near future.

As a general-purpose language, Holt said, Turing is useful for basic data pro-cessing, microcomputer and scientific applications, as well as for programming that involves data structures and link lists.

In its current form, however, the lan-

guage is not designed for large, business-oriented DP shops. "It's not as good as Co-bol for large file processing applications or for those applications that utilize dollar-type scaled integers," Holt admitted.

You could use it and it would be better than Basic or Pascal, but whether you could convince people with a large invest-See TURING page 49

Adesse packages updated/45



IDMS gets planning and development tool/45

# INSIDE

Systems Software/45

Productivity Aids/45

Application Packages/45

DBMS/47

Languages/47

On-Line Data Bases/48

**SOFTLINE/THOMAS O'FLAHERTY** 

# Needs of the '80s will alter training

First in a two-part series
In many organizations, a "programmer trainee" is considered at best a necessary evil and at worst a lower form of life. This is in spite of the many desirable traits of trainees. These include few ego problems, willingness to work for low salaries, few technical bad habits, potential for several promotions, high probability of loyalty to the firm and willingness to work hard.

Many "experienced" programmers not only lack these characteristics, but also often overvalue their obsolescent skills. Trainees are traditionally unpopular because they:

Can't start programming on Mon-

■ Require training overhead (the trainee's own time plus the time of experienced staff).

May have no interest in, or potential for, the work.

■ May leave the firm as soon as the training is over.

These are real issues. Dealing effectively with the first two issues requires a planning process that is adhered to. Weeding out those with no interest or aptitude means avoiding taking trainees right off the street and putting them into

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# Adesse enhances packages for VM operating system

series of enhancements and updated releases of its software packages for

use with IBM operating systems.

Adesse announced Release 1.3 of its CMS Read/Write OS Dasd (Direct Access Storage Device) Support system, which incorporates support for IBM's CMS/SP Release 3 operating system. The system reportedly permits a CMS application to write files on IBM OS-format disks. It can be used to write on disks that are also used by IBM's OS, VS or DOS operating systems as a means of transfer-

In addition, Adesse announced that its VM/SP Enhanced Page Migra-Adesse announced tion (EPM) system is now supported in IBM multiprocessing or dyadic processing environments under VM/ SP Release 2 and Release 3. EPM also supports Release 3.2 of IBM's VM/SP

High-Performance Option.

Adesse also announced its VM/SP Shared File Directory Facility (SFDF), which reportedly eliminates duplicate storage associated with

one copy of the File Status Table entries for a disk to be shared by all users who access it. Also, the firm an-nounced the Single System Image (SSI) control program for use with Release 3 of VM/SP.

the system is said to manage the sources of IBM and compatible 370, 4300 and 30 series system complexes to provide multiple users with virtumachine facilities. According to the vendor, SSI is a comprehensive facility that allows several VM processors to appear to the user community as a single CPU.

CMS Read/Write OS Dasd Support is licensed for \$150/mo per CPU or can be purchased for \$5,000; EPM is licensed for \$250/mo and can be purchased for \$9,000; SFDF is licensed for \$100/mo and can be purchased for \$1,900; and SSI is licensed for \$4.500/mo and can be purchased for

Adesse can be reached through P.O. Box 607, Ridgefield, Conn.

## SYSTEMS SOFTWARE

#### HOLLAND SYSTEMS CORP. SSP Version 2.4

Holland Systems Corp. has released an enhanced version of the software portion of its information

source management product.
Version 2.4 of Strategic Systems Planning (SSP) includes an additional 18 reports, automates the development of an information requirement dictionary and enhances the error checking process during data entry, a spokesman said. It reportedly provides improved user control of the clustering threshold used in defining the information structure.

SSP runs on IBM or IBM-compatible mainframes under IBM's OS/MVS operating system. SSP Version 2.4, software, method, educa including tion and documentation, is priced at

Holland Systems, 3131 S. State St., Ann Arbor, Mich. 48104.

# NORTH AMERICAN SOFTWARE

North American Software has announced Jobqueues, a multiple job queue package for the IBM System/ 34 and System/36.

According to the vendor, Job-queues boosts IBM's JOBQ function throughput in a mixed job environ-ment, such as IBM's Mapics (Manufacturing, Accounting and Production Information Control System) and DFAS-II (Distributed Financial Accounting System).

Jobqueues was designed to conform to IBM syntax and screen-handling techniques. Suitable for any JOBQ job, the system features job conflict resolution, four-level security, power-fail restart, performance sting and automatic Operator Control Language conversion. It is priced at \$495.

North American Software, P.O. Box 440398, Denver, Colo. 80014.

## PRODUCTIVITY AIDS

#### OXFORD SOFTWARE CORP. UFO, Mexicale price changes

Oxford Software Corp. has announced price changes for its product

User Files On-Line (UFO) is an online application development system for IBM CICS and IMS/DC environments. For UFO/CICS, the new prices are \$27,000 for IBM's DOS operating system and \$38,000 for IBM's OS op-

erating system.

Prices for Maxicalc, an electronic spreadsheet for CICS environments. are reduced to \$9,000 for DOS and \$12,000 for OS.

UFO/Cobol is an on-line CICS application development system that uses standard Ansi Cobol as its development language. The DOS price is \$24,000, and the OS price is \$33,000. Until April, introductory prices are \$18,000 and \$24,750.

Oxford Software, 174 Boulevard, Hasbrouck Heights, N.J. 07604.

## APPLICATION PACKAGES

#### DATA DESIGN ASSOCIATES, INC. Accounts payable enh

Data Design Associates, Inc. has announced an enhancement to its accounts payable system for mainframes and large minicomputers.

According to the vendor, the system now helps companies comply with the backup withholding and re porting provisions of the Interest and Dividends Tax Compliance Act of 1983. The system recognizes when withholding should occur and automatically calculates and deducts the

proper amount from a vendor's invoice. It is written in Cobol.

An on-line version is available for IBM mainframes and large minicom puters, and a batch version is available for all major mainframes. system sells for \$35,000 to \$53,000.

Data Design Associates, 1279 Oak-Pkwy., Sunnyvale,

# DISTINCTIVE SOLUTIONS

rcial Finance System CPS/3000

Distinctive Solutions Corp. has announced an interactive, modularly designed system for processing and monitoring commercial finance struments, such as revolving loans, commercial loans and leases.

Commercial Finance System CFS/ 3000 is designed to operate on the Hewlett-Packard Co. HP 3000 superminicomputer and is available now

It is said to allow input through enu selections or fill-in-the-blanks forms, with an on-line Help system intended to reduce errors.

The price depends on the number and type of modules ordered, with minimum packages costing \$100,000. Distinctive Solutions, 1305 Marsh St., San Luis Obispo, Calif. 93401.

# Release 3.0 of DBDM out

ETA International, Inc. has announced Release 3.0 of its Data Based Development Methodology (DBDM), which is described as a systems planning and development methodology for use with Cullinet Software, Inc.'s IDMS. Integrated Data Dictionary and ADS/On-Line software.

DBDM provides detailed dards, procedures, controls and deliverables necessary to implement prodata communications and data dictionary environments. It reportedly consists of modules that support the planning, analysis, design and implementation of data-based development.

The DBDM modules include business systems planning for business and MIS, business function analysis, logical data base definition, program definition for data-based systems physical data base design and data implementation guidelines

DBDM is licensed for \$18,000, including the six primary modules, all supplemental modules and five days of customized on-site workshops.

ETA International, Seven Ave., Newton, Mass. 02159.

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# TRAIN from page 43

a programming job.

The problem of "training a programmer for someone else" is the heart of the rational opposition to using trainees. Trainees do leave, but for the same reasons so other employees. Input, Inc.'s research indicates that the primary reasons for turnover in technical positions in the information systems department are:

Lack of opportunity to learn or to work on challenging projects.

A nonsupportive management structure.

Obsolescent technology.
 Nonexistent or unclear

Nonexistent or unclear

Unfortunately, all of these problems are often the direct result of training programs. In many trainee programs, it is apparent that management doesn't really know what to do with trainees. Usually there is an initial solid block of training that goes on for weeks. This is far too much to be absorbed at one stretch. especially when much of it is not (and cannot be) put to immediate use. Often, formal education is very hard to come by after the initial period - even when it is desperately needed.

After the block of formal education, trainees are often placed in the most difficult (and usually least rewarding) job in the information system department: maintenance. They are often assigned to a job and/or supervisor that knowledgeable employees successfully

The consequence of this classroom-maintenance sequence is that after a year, the trainee:

■ Does not have a very broad perspective of data processing.

Has picked up knowledge that is usually obsolescent and often wrong.

■ Has done, at best, a mediocre job (the brighter trainees will be aware of this).

With an experience that ranges from unsatisfying to disagreeable, is it any wonder that trainees would look to other organizations for employment?

Why are so many training programs like this? Our research indicates that this is because so many trainees are hired in an unplanned fashion.

Let's take a look at hiring patterns before the recent economic crunch. Looking at a broad sample of corporations, over 40% of hirings were for new positions created by growth. However, companies generally wanted to fill 80% of their openings with experienced people. This is mathematically impossible. Consequently, actual trainee hirings track the numbers of new positions very closely.

This is a game of musical

chairs; instead of chairs being subtracted, they are added. New recruits are hurriedly found, but not planned for and not really wanted.

and not really wanted.

Information systems departments should face mathematical reality and plan to hire trainees regularly. This will be much easier to do if information systems management believes that trainees have the potential for becoming superior employees.

Effective training programs

are needed to make this potential a reality.

The new system environment will require, besides technical skills, aptitude in systems analysis and interpersonal relations and a knowledge of underlying business issues. This suggests that future trainees will have more diverse backgrounds than trainees now usually have.

Whatever the eventual structure of data processing,

it will continue to need skilled people. Effective training will have at least as large a potential payoff in the future as it does now.

A successful training program will have these components:

■ Both the organization and the trainee feel that the trainee is making a tangible contribution to the organization very early in the trainee's career.

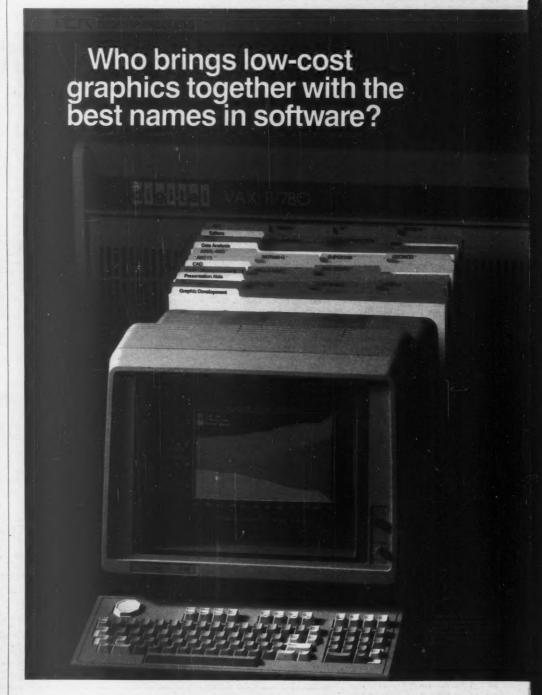
■ The trainee receives

textbook knowledge in the amounts required and at an appropriate time.

Trainees have a positive view toward their job and the organization from the start.

Trainees stay with the organization.

O'Flaherty is principal consultant and director of software programs at Input, Inc., a research and consulting firm in Saddle Brook, N.J.



# TOOLS from page 45

CYBORG SYSTEMS, INC. Payroll; Human Resource Management

Cyborg Systems, Inc. has announced that its Payroll and Human Resource Management packages are now available for use in the IBM IMS DB/DC environment.

According to a company spokesman, standard IMS utilities may be used for

backup and recovery.
One feature is said to be the ability to create new online screens within the Cyborg program, bypassing the Message Format Services of IMS for immediate use with-

out recompiling programs.

The IMS feature is priced at \$50,000.

The base price for the Pay-roll package is \$45,000, while the Human Resources Management \$35,000. package

Cyborg Systems, 2 N. Riverside Plaza, Chicago, Ill. 60606.

### DATA BASE MANAGEMENT SERVICES

JCA SOFTWARE, INC. Sort-On-Line

JCA Software, Inc. has an-

nounced a software system said to provide an on-line sorting capability in the Cullinet Software, Inc. IDMS/DC data base management system environment.

Sort-On-Line (SOL) reportedly improves the ability of IDMS users to obtain information from the data base in sequences that are different from the way in which the data was originally stored.

The on-line sorting capa-bility also works for Scratch,

Queue and Table records, the vendor said.

SOL enables the end user to specify dynamically the sort sequence desired at the moment without need for program definition by a programmer, according to the vendor.

The product is fully com patible with Cobol, PL/I and Cullinet's Application Development System/On-line programs, the vendor said.

A license fee for SOL costs \$10,000.

JCA Software, Suite 224, 2182 Dupont Drive, Irvine, Calif. 92715.

# Tektronix.

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Tektronix

# LANGUAGES

WHITESMITHS LTD. C/370

Whitesmiths Ltd. has announced C/370, said to be a C language compiler for the IBM 370 mainframe architec-

A vendor spokesman said C/370 permits C program development in the IBM mainframe environment and allows Digital Equipment Corp. VAX-11 users to move existing C and Unix applications to the IBM 370 architecture through recompiling and relinking.

The standard C/370 package includes Whitesmiths' Pascal-to-C translator, which reportedly gives users the ability to run Pascal programs in the 370 environment as well.

The spokesman said C/370 is a full implementation of the standard C language. It runs on all IBM 370, 4300 and 30 series and plug-compatible mainframe systems. It also operates with IBM's VM/ CMS, through OS simulation and MVS/TSO, the vendor said.

C/370 is priced at \$4,000 until March 30 and \$5,000 after that date, according to the vendor.

Whitesmiths, 97 Lowell Road, Concord, Mass. 01742.



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# DBMS from page 43

provided an IBM SQL lookalike query language that takes dead aim at IBM's decision to use SQL as a front-end language to DB2. Furthermore, Teradata claims to use a "true" relational DBMS combined with a processing architecture "built to support the relational model," according to Michael Ehrensberger, Teradata's eastern regional manager.

Teradata doesn't expect its data base approach to replace IMS or any other prod-uct DBMS soon. "Companies have a lot of money invested in their IMS data base, and we'd be foolish to expect they're going to give it up for Ehrensberger model. said. But the company expects that growing informa tion center requirements and the corresponding demand for relational processing will push companies to seek a more efficient way to process data for end users. In fact, part of the company's documentation offers guidelines for which applications are best offered on DBC/1012 and which are best left to IMS

DBC/1012 uses Intel 8086 microprocessors, called Access Module Processors (AMP) running in parallel and controlled by Teradata's Ynet network processor, which consists of an array of active logic. Each processor has a dedicated 475M-byte Winchester disk drive with the data distributed evenly among the drives.

Requests are translated and distributed by an interface processor and sent to the AMPs, which access the

#### ON-LINE DATA BASES

DOW JONES & CO., INC. Dow Jones News/Retrieval via Net 1000

Dow Jones & Co., Inc. has announced that its Dow Jones News/Retrieval business and financial information service is available through AT&T Information Systems, Inc.'s Net 1000 shared network service.

The Dow Jones News/Retrieval service provides users with business and economic news, securities quotes, financial and investment services and general news through its 27 data bases.

The service is offered through two pricing plans, both of which include a \$75 sign-up fee. The standard pricing plan prices vary between 60 cents and \$1.20 per connect minute. The executive pricing plan prices, which include a \$50 monthly fee per user site, range between 40 cents and 80 cents per connect minute.

Dow Jones & Co., P.O. Box 300, Princeton, N.J. 08540. data in parallel. Responses are transmitted over Ynet and coordinated and translated by the interface processor for return to the mainframe over a block multiplexer pipeline. Each processor can perform 30 access/sec, making a total access rate of over 30,000 access/sec achievable in the

largest configuration.
Teradata has also challenged the IBM price umbrella. Storage can be added at

the rate of \$37 per megabyte, and horsepower can be increased at a cost of \$60,000 per Mips.

In designing DBC/1012, Teradata employed the advice of 18 Fortune 500 companies over a 2½-year period to design the system in an agreement it calls the Partner Program. The companies provided input at each step of the design process in exchange for a discount on DBC/1012. Teradata claims

to have letters of intent to purchase from nearly every member of the Partner Pro-

The company faces an uphill struggle, however. The DP community is clearly skeptical of data base machines in light of their poor market performance to date. Teradata must also face up to the formidable disadvantage of not being IBM. Few companies will be eager to sink one million dollars or more in a complex system from a company that may not be around to support it in the future. It's easier to license DB2 for \$30,000 a year and get the peace of mind of knowing it will always be supported.

will always be supported.

Teradata expects to be profitable by the end of the year, and it will be worth watching to see if it achieves its objectives. If so, the company may open a door which many in the industry thought was fast closing.



TURING from page 43 ment in Cobol to switch is another matter entirely."

Holt said that inadequacies in PL/I and Pascal provided the impetus for the development of Turing. "We wanted to be able to use and teach the state of the art in software, which essentially left us the choice of PL/I and Pascal. PL/I had a lot of the power and Pascal had a lot of the elegance we wanted, but

those systems don't incorporate many of the things that have been learned in the last decade."

Perhaps the most important advances those languages fail to utilize, he said, are modular programming techniques that allow a programmer to isolate one or more segments — or modules — of a code from the rest of the program.

The modules accommodate a building-block approach to

system design and maintenance, an approach that ensures accuracy and flexibility, Holt said.

"We wanted a language that was easier to use than Basic, and I think we accomplished that," Holt said. "It has a very simple, clean syntax. You write down what you want done, and the language does it. That's different from Pascal or PL/I. [Turing] reads much like a simplified version of Pascal,

yet it's more powerful, and it leaves behind the syntactic frills of Pascal. You have procedures that appear similar to Pascal procedures, but they are shorter and simpler."

Holt said the structured Turing language incorporates sophisticated debugging techniques, such as consistency checking, that ensure program accuracy. "There are many things that other languages allow that

simply don't make sense. But Turing has built in, from an engineering standpoint, many features that minimize the number of errors that show up in your production program," he said.

#### No 'lurking bugs'

"The result is that when you first get your program running, it's correct. You don't have a whole series of lurking bugs that show up days, weeks or even months later," Holt added.

Turing has been well received by Holt's peers in the academic community, but the development group now faces the task of building a commercial user base. "We are hoping that people will see that this language is on the leading edge in software design.

"Most people who have seen it come away saying that it is. Turing is clearly better, but whether people with a large investment in other languages will convert is the real question. I believe that's a real possibility."



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# **COMMUNICATIONS**

# Nacha offers paperless trade system

By Patricia Keefe CW Staff

WASHINGTON, D.C. — A system that electronically replaces the paper checks used in processing debits and credits between participating companies and their trading partners has been unveiled by the National Automated Clearing House Association (Nacha).

Corporate trade payments (CTP) are transmitted via any of 30 automated clearinghouse (ACH) networks, which provide a telecommunications link between banks, savings and loan associations and credit unions. The network reportedly replaces a total of 400 million checks annually.

Most of the regional automated clearinghouses utilize the clearing facilities, delivery methods and settlement services operated by the Federal Reserve System,
although some utilize private processing
facilities as well. Each clearinghouse is responsible for forming membership policies, pricing structures and the operating
policies within its own region. Nacha establishes and maintains rules governing
the exchange of automated clearinghouse
payments between clearinghouse regions,
as well as providing standards and technical support facilitating the same.

Nacha conducted a study in 1981 to determine whether development of electronic CTPs was warranted, and whether it was feasible to send those payments through the ACH. Study results included:

Each of the corporations indicated interest in sending trade payments through the automated clearinghouse regardless of their level of automation.

Forty-four percent of the corporations were involved in a net settlement system within their industry.

■ The number of financial institutions with which they had accounts ranged from one to 90 on the accounts receivable side, with an average of 22 banks, and one to 50 on the payment disbursement side, with an average of 17. All of the corporations indicated the majority of their trad-

See NACHA page 53

# Confusion follows divestiture Companies report service problems

In preparation for the

divestiture, Bank of

America forecast that

quality of service

would drop and tried

to establish . . . tactical

plans around that fact.

By John Dix

"Genuine, legitimate and honest confusion" is how one communications manager contacted in a recent informal telephone survey summed up operating conditions in the environment created by the AT&T divestiture.

Each company queried related some dissatisfaction with the quality of service they have been receiving from the regional telephone holding companies

and AT&T since they were separated on Jan. 1. The degree of dissatisfaction ranged from simple annoyance at having to work with new contacts within the carrier organizations to disgust with the inability of those companies to complete even modest requests.

J. F. Sheedy, manager of network services for International Harvester Co. in Chicago, said there has been a noticeable lag in service and in getting things repaired, but that the company has been able to operate on a relatively even keel. Sheedy credits Harvester's stability to the fact that the company isn't in the midst of any major communications projects and that it uses communications equipment from many vendors.

There have been some problems, however. In the worst case, a disconnect order was issued for four Wats lines at a Harvester facility in Memphis, Tenn. "The order got bungled between AT&T and [Southwestern Bell Corp.]," Sheedy said, "and instead of taking down four lines, all 15 Wats lines at that location were disconnected." Service on all but two of the lines was restored within six hours, and the others were received the part does.

repaired the next day.

Sheedy said that in most other instances Harvester has had little problem getting business and Wats lines in-

stalled, but has experienced trouble in getting lines repaired. "There are more steps to go through now," Sheedy said, and "when you call a [regional holding company] with a problem, you often get shuffled around, and sometimes they have trouble finding your records."

The one major equipment delay that Harvester has experienced was in Fort Wayne, Ind. Sheedy said that AT&I Information Systems, Inc. reported that it will not be able to meet a delivery schedule for a Dimensional Systems.

schedule for a Dimension System 85 that was to replace a Centrex-customer premise site, supported by non-AT&T. General Telephone, the local telephone company. Sheedy is uncertain if the delay stemmed from divestiture or if AT&T is behind schedule in the construction of this new digital pri-

vate branch exchange.

At Bank of America in San Francisco, Lloyd Isaacs, vice-president of international information technologies, reported that he has experienced increased lead times for line facilities and equipment. But that has not come as a surprise.

In preparation for the divestiture, Bank of America forecast that quality of service would drop and tried to establish two-, three- and four-year tactical plans around that fact.

In day-to-day operation, Isaacs said, "the placing and processing of orders has become confusing and time-consuming." He believes that one of the primary tasks at hand is to try to establish a working relationship with the splintered pieces of the Bell system. As he pointed out, there are regulated and nonregulated subsidiaries of the regional holding companies to deal with, as well as the similiar delineation at AT&T between AT&T Information Systems



AT&T published an X.25 interface technical reference/53

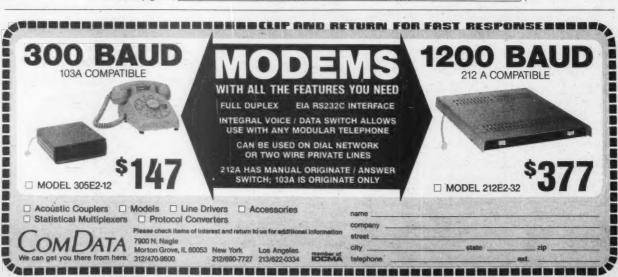
MCI offers electronic mail access to telex subscribers/51

# INSIDE

Communications
Controllers/81

Voice/Data Communications/51

Auxiliary Equipment/51



#### COMMUNICATIONS

# COMMUNICATIONS CONTROLLERS

PROTOCOL COMPUTERS, INC. **CPT 8276 SNA controller; Wordplex** converter

Protocol Computers, Inc. has announced two products that provide IBM compatibility — the CPT 8276 SNA controller and the Wordplex converter.

The CPT 8276 SNA controller enables CPT Corp.'s word and data processing systems to communicate with IBM host computers. The product allows seven devices to be linked to an IBM network utilizing IBM's System Network Architecture (SNA). workstations can be linked directly to the IBM network or can utilize dial-in capabilities, such as the ability to store data locally or to word process documents with the CPT terminal and then transfer the data to the IBM host for electronic mail or other processing purposes, the ven-dor said. The price is \$7,000.

The Wordplex converter enables Wordplex Corp.'s workstations to communicate with IBM host computers. The workstations can be linked directly to an IBM network or can utilize dial-in capabilities for low-volume applications, the vendor said.

The converter is available in 1-, 3-, 5- and 7-port configurations. Prices are \$2,900, \$3,900, \$4,900 and \$5,600, respectively.

Protocol Computers, 6150 Canoga Ave., Woodland Hills, Calif. 91367.

# VOICE/DATA COMMUNICATIONS

TIMEPLEX, INC.

Timeplex, Inc. has announced a voice digitizing option for the company's Link/1, the T-1 facilities management system.

The option enables up to 48 analog voice channels operating at 32K bit/ sec to be digitized and multiplexed over a T-1 line operating at 1.54M bit/sec.

The option is offered in multiples of four voice channels, the vendor

Voice modules may be mixed in any proportion with the four-port synchronous data card with the

Link/1, according to a company

spokesman.

The voice option is priced at \$3,550.

Timeplex, 400 Chestnut Ric Road, Woodcliff Lake, N.J. 07675. 400 Chestnut Ridge

electronic typewriters and telephone lines, according to a spokesman for the vendor. The service reportedly allows shorter transmission time and guarantees 5-min delivery. It also permits customers to edit, update and transmit messages, the vendor

through standard microcomputers or

According to the vendor, the ser-vice is compatible with microcomputers from 28 different manufacturers. Customers receive free-of-charge preprogrammed Supertelex software on floppy disk format.

There is no monthly charge for Supertelex service, according to a company spokesman. International rates

vary and are obtainable from the vendor. IRC, 211 E. 43rd St., New York, N.Y. 10017.

#### **AUXILIARY EQUIPMENT**

INTERNATIONAL RECORD CARRIER, INC. Supertelex

International Record Carrier, Inc. (IRC) has introduced Supertelex, an international telex service available to North American customers.

IRC transmits worldwide via its London-based computer center. Customers link up to this facility

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# MCI service transmits mail to telex users

WASHINGTON, D.C. - MCI Communications Corp. recently announced MCI Mail Telex Dispatch, a service to transmit electronic mail to telex customers and vice versa.

The service reportedly allows MCI Mail subscribers to transmit mes-sages to telex subscribers worldwide and for telex subscribers to send mes-sages to MCI Mail customers.

MCI Mail customers can send dispatches electronically to telex terminals with charges based on an MCI "mini-ounce," which equals 400 characters, MCI said. Rates vary according to the country of destination. Rates are available on-line to MCI customers.

There is no charge to MCI Mail subscribers for receiving telex mes-sages, according to MCI, 1133 19th St. N.W., Washington, D.C. 20036.



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# COMMUNICATIONS

# X.25 reference describes specs

BROOKLYN, N.Y. - AT&T Communications has announced an updated technical reference describing X.25 packet-switching network in-terface specifications for data sys-

terface specifications for data systems users and manufacturers.

"X.25 Interface Specifications and Packet-Switching Capabilities" replaces a 1981 issue and describes X.25 features currently supported by AT&T and those considered for support in 1984 and 1985. It costs \$37, plus \$1 for shipping, and is published by Literary Data Center, Inc.

Literary Data Center, GPO Box C-9104, Brooklyn, N.Y. 11202.

# NACHA from page 50

ing partners did have electronic

funds transfer capabilities.

Data standards were a concern among most of the corporations. Data specifications had to allow for invoice and payment information to flow through the automated clearing-

Also, benefits cited for using cor-porate trade payments included better cash management controls, im-proved business relationships due to knowledge of exact day credit or debit, reduction of paper and paper-re-lated costs, more efficient use of personnel, better investment planning and improved speed of business ac-

The technology developed for corporate trade payments is similar to,

although more complex than, the systems instituted several years ago to handle the automatic deposit of pay-roll, pension and social security pay-ments for consumers, Nacha said. Corporate trade payment rules and regulations differ substantially from that of automated clearinghouse consumer payments. For example, corporate trade payments allow payment of multiple invoices with a single transaction. Also, the system was designed with safeguards, such as maximum dollar limitations that must be specified on individual debit entries.

One of the issues that had to be re-solved in the development of a viable trade payment system was that of "float" — the interest earned on funds during the time period from which a check is issued until it is ac-tually debited to the account. However, one method some corporations use to eliminate float impact, according to Nacha, is through renegotiation payment terms with major trading partners. These new terms might offer higher discounts or extended pay-ment due dates in exchange for electronic payment in immediately usable funds.

With the successful completion of the test phase, Nacha claims it can now offer corporate trade payments to companies of all sizes.

A recent announcement by the U.S. Treasury Department indicating that it will begin making corporate trade payments with some of its trading partners in 1984 is expected to boost the volume of trade payments.

More information is available from Nacha, located at 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

# DIVEST from page 50

and AT&T Communications.

We're going to be faced with 12 to 15 more months of this cloud before these things get sorted out," Isaacs said. In the interim, "decisions are going to have to be made under a greater dayre of uncertainty." greater degree of uncertainty.'

This is forcing Bank of America to assume greater responsibility in the management of its communications facilities. As an example, Isaacs said that before divestiture, it had on order with AT&T a large Electrical Tandem Network. Now Pacific Bell Telephone Co. will own the switches, and AT&T will provide the interstate lines. "Whereas we had made the de-cision to go with a single provider of a network, now the responsibility falls in more than one camp. We have to take on the role of coordinator."

The only equipment delays Bank of America has experienced have resulted from order foul-ups. In one notable instance, Isaacs said that an order was noted as complete when it was not, and it had to be reinitialized.

At Colgate-Palmolive Co. in New York City, Manfred Zerbe, director of communications services, said that it will be hard to disappoint his compa-ny because it has been anticipating the worst from divestiture.

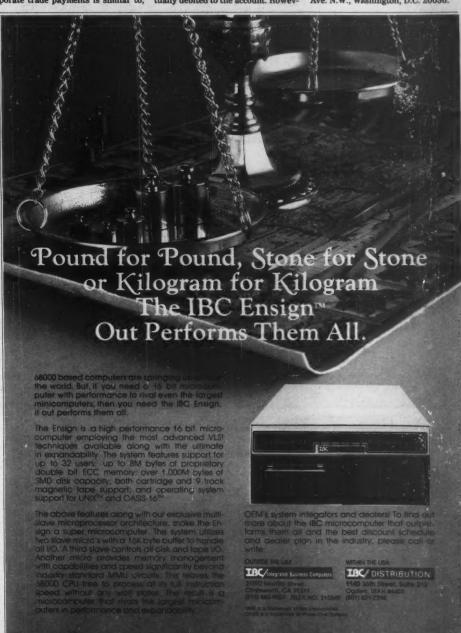
Colgate's experience in the divest-ed environment has been limited because the company didn't have a backlog of equipment and services. For the few equipment problems the company has experienced, the AT&T Information Systems Customer Service Support Operation provided a single point of contact, relieving Col-gate of the responsibility of deter-mining whether the problem was with AT&T Information Systems, AT&T Communications or New York Telephone Co., the communications director reported.

One point of irritation for the com-

pany came from the back-ordering of some electronic key systems that AT&T Information Systems said it would deliver in mid-January. More irksome than the actual delay was the fact that this information had to be pried out of the company.

A communications manager at a large Massachusetts company who asked to remain anonymous said that the service his company is receiving is horrendous.

The root of the problem lies in lousy coordination between AT&T and New England Telephone Co., the contact said. "I'm just glad we're not planning any network expansion,'







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AT&T Information Systems, the company whose unparalleled communications heritage has been bringing people together for 100 years, now brings your office together. With

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Moving Information — Speeds documents to many people in different locations simultaneously so they can act decisively. EDC allows you to determine the timing and cost of delivery, and even check to find out when documents were received. Using a password ensures the privacy of your messages.

Managing and Storing Information -Locates documents, and retrieves and evalu-



ates contents quickly and easily with electronic files-while reducing the possibility of losing documents. An electronic "Mailbox" allows you to quickly determine which documents to read first. EDC reduces storing and filing costs with an electronic "Archives that allows for either short- or long-term storage, and the "Wastebasket" which enables you to permanently delete items after a determined period of time. There's even an electronic "Calendar" that checks personal schedules and arranges mutually convenient meetings.

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body on board. And as new features are developed in the future, they'll be compatible with your existing equipment.

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Systems Laboratories. AT&T Western Electric produces EDC, and AT&T Information Systems will maintain it with comprehensive, conscienwill maintain it with comprehensive, conscientious service from the largest service organization in the industry. To find out more, call toll-free 1-800-247-1212, Ext. 879M.

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# "IDMS/R represents a major advance in database technology."

Dave Litwack'

# Because IDMS/R is the first relational DBMS designed for both the DP professional and the enduser.

IDMS/R is not only a relational database management system, but a particularly powerful one. IDMS was made relational by removing all pointers and allowing the user to define data as tables and providing the traditional relational operators such as selects, projects and joins. The major benefit of a relational DBMS is the capacity to develop applications faster because the developer does not have to be concerned with the database design. IDMS/R provides this and much more.

For example, the Automatic System Facility (ASF) of IDMS/R is a major advance over fourth generation languages. The ASF is so comprehensive and easy to use that all a user need do, to develop an application, is define a relational record. The Automatic System Facility dynamically generates all necessary supporting structures including data definitions, screen formats, application processing logic, and documentation.

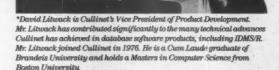
So, the developer can witness

the application being produced, literally, in seconds. This capability makes IDMS/R the perfect system Data processing professionals can use the ASF to help develop production applications. The ASF can be used to build a prototype that can be enhanced, using Cullinet's fourth generation language, ADS/OnLine, into a complex production application. But, when they build a complex high volume application using IDMS/R, DP professionals require outstanding performance. Typically, 5% of the data relationships (joins) in any application are accessed 95% of the time. With IDMS/R, they can simply change these relationships to predefined joins and benefit from a dramatic boost in performance. We call it Relational Fastpath. Relational Fastpath makes IDMS/R a unique DBMS and a perfect system for DP professionals' system development needs.

In addition, IDMS/R has the most sophisticated back-up and recovery capability of any DBMS, full integration with personal computers and is also integrated with Cullinet's complete line of financial and manufacturing applications.

In summary, IDMS/R was designed to satisfy the requirements of those who want to develop applications faster and those who have the responsibility

of processing them.
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coupon or call Cullinet at 1-800-225-9930
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# IDMS/R Seminar cities and dates

TOTAL	TEN		CIMCS	CHILL CICL	VC3
City & State	Date	City & State	Date	City & State	Date
Albany, NY	Mar 13	Indianapolis, IN	Mar 27	Omaha, NE	Mar 1
Allentown, PA	Mar 1	Jackson, MS	Mar 15	Orange County, CA	Mar 6
Atlanta, GA	Mar 28	Knoxville, TN	Mar 28	Oshkosh, WI	Feb 28
Arlington Hts., IL	Feb 23	Lexington, KY	Mar 30	Pittsburgh, PA	Feb 29
Augusta, GA	Mar 14	Little Rock, AK	Mar 13	Portland, OR	Mar 15
Boston, MA	Mar 8	Los Angeles, CA	Mar 27	Providence, RI	Mar 22
Bridgeport/	Mar 6	Madison, WI	Mar 15	Quincy, IL	Feb 29
New Haven, CT		Meadowlands, NJ	Mar 7	Raleigh, NC	Mar 20
Charleston, WV	Feb 29	Memphis, TN	Feb 23	Rochester, NY	Mar 28
Charlotte, NC	Feb 23	Merrimack, NH	Mar 29	San Antonio, TX	Mar 15
Chicago/	Mar 20	Milwaukee, WI	Mar 7	San Diego, CA	Feb 23
Rosemont, IL		Minneapolis, MN	Mar 28	Springfield, IL	Mar 5
Cincinnati, OH	Mar 21	Montreal, PQ	Mar 14	Springfield, MO	Mar 29
Cleveland, OH	Mar 28	(French)		Spokane, WA	Mar 28
Columbus, GA	Feb 28	Montreal, PQ	Mar 21	Tallahassee, FL	Mar 1
Columbus, OH	Mar 9	(English)		Toledo, OH	Feb 24
Davenport, IA	Mar 13	Nashville, TN	Feb 16	Toronto, ON	Mar 20
Detroit, MI	Mar 14	New Orleans, LA	Feb 23	Tucson, AZ	Mar 20
Ft. Lauderdale, FL	Mar 22	New York, NY	Mar 20	Vancouver, BC	Mar 14
Pt. Wayne, IN	Mar 6	New York/	Mar 27	Washington, DC	Mar 8
Ft. Worth, TX	Mar 15	Long Island, NY	0.01	Wichita, KS	Mar 8
Grand Rapids, MI	Mar 27	New York/Rye, NY	Mar 13	Wilmington, DE	Mar 27
Greenville, SC	Mar 6	Oakland, CA	Mar 13	Winnipeg, MB	Mar 6

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# What's plaguing big CPU makers

HARD TALK

TOM HENKEL

The big five mainframe makers all have the same problem. With mainframe architectures pushing 20 years old, they are quickly running out of

CW Serior Editor clever ways to boost system performance. All five have tried to update their mainframe systems with newer technology, but all are bound by a morass of software that makes developing an efficient processor difficult. All five are also facing user demands for bigger, faster systems that take up less space, use less power and are more reli-able than existing systems.

The problem is a complex one. Each time a mainframe vendor announces a system enhancement that offers 11/4 or two times the performance of an older system, it takes one step closer to the technological limitations of its mainframe architectures. And with each doubling of performance, the vendors take even larger steps toward that technologi-

Unlike the entrepreneurial firms developing systems based on microprocessors, mainframe vendors do not have the luxury of developing systems from scratch. Users of mainframe systems are so heavily committed to existing software environments that they are not in a position simply to "make a conversion." Large corporations, whose systems contain millions of lines of code, just cannot make a conversion. IBM learned a painful lesson back in the early 1970s when it pushed 360 users into converting from a DOS- to an OS-oriented operating system. There are still DP executives who hold a grudge against IBM for that conversion. And that was a much simpler time for DP shops. Today, such a conversion would be physically impossible for many shops.

The solution appears to be a transition See VENDORS page 68

# IBM unveils impact line printer Can operate at 3,600 line/min

RYE BROOK, N.Y. — IBM has unveiled what it claims to be its fastest impact line printer, the 4248.

The unit can operate at 3,600, 3,000 or 2,200 line/min. At 2,200 line/min, the unit can print optical recognition characters, according to IBM.

The printer uses about 46% less power and produces about 26% less heat than the earlier IBM 3211, a 2,000 line/min impact printer. In addition, the 4248 can run all 3211 programs. the IBM spokesman said.

Through program control, an operator can change speeds, select between six or eight vertical line space/in. or adjust ham-

The unit is equipped with microproces-sor-controlled self-diagnostics and uses a 12-char. display for diagnostic and test messages, IBM said. The 4248 can be optionally expanded

from 132 to 168 print positions. This option allows side-by-side printing of two 814-in.-wide sheets of paper, a spokeswom-

A basic 4248 Model 1 printer costs \$99,000 and will be available in March. ase plans are available through the IBM Credit Corp. starting at \$1,926/

mo. The minimum monthly maintenance charge on the 4241 is \$975. The option to expand the maximum number of print positions from 132 to 168 costs \$10,000 when installed at

the factory and \$15,000 if installed in the field. Volume discounts of up to 20% are available to users who purchase mixed orders of the 4248 and the 2,000 line/min 4245 printer, according to an IBM spokes-

The printer was announced by IBM's Information Systems Group at 900 King St., Rye Brook, N.Y. 10573.

PERKIN-ELMER Perkin Elmer Corp.

has unveiled a high-speed band printer for its line of superminicomputers/60

Array processor out for DEC VAX line/60

# INSIDE

Tumkey Systems/60

Data Storage/90

Terminals/62

Printers/Plotters/62

Graphics Systems/63

Power Supplies/64 Board-Level

Devices/65

Auxiliary Equipment/65

# Apollo DN320 workstation bows

CHELMSFORD, Mass. — Apollo Computer, Inc. has introduced a 32-bit, floating-point workstation said to offer three es the floating-point performance of

The floating-point computational per-formance of the DN320 is equivalent to larger systems, such as Digital Equipment Corp.'s VAX-11/730- or VAX-11/750-class machines, for one-third to one-half the price, the vendor claimed.

In addition, the firm reportedly has more than doubled the storage capacity available for the DN300 and 320 workstations with a 70M-byte Winchester disk drive and two 8-in. Winchester-type disk drives offering 80M and 167M bytes of storage. The drives can be used on the DN460 and DN660 processor nodes and DSP160 server processor

The DN320 features 1.5M bytes of main memory; the firm's windowing software, which can handle up to 25 concurrent processes; 16M bytes of virtual address space per processor; high-resolution bit-mapped graphics; and connectability to Apollo's Domain local-area network. The unit's 17in., monochromatic display offers a 1,024by 800-pixel resolution, detachable keyboard and optional touch pad or mouse.

The DN320 node and disk are said to allow users to mix systems of varying pow-

The DN320 is priced at \$23,400.

The 70M-byte disk features random-acss seek time of 45 msec. A 1.2M-byte floppy disk is optional for backup, software distribution or personal storage. The 70M-byte disk costs \$12,800, or \$14,300 if integrated with the floppy disk. The 80M-byte disk is priced at \$12,800; the 167Mbyte disk is \$16,800.

Apollo is located at 15 Elizabeth Drive, Chelmsford, Mass. 01824.

# Tandem 653X line gets 3270 emulation, voice recognition

By Jeffry Beeler CW West Coast Bureau

- Tandem CUPERTINO, Calif. -Computers, Inc. has enhanced its 653X terminal line with IBM 3270 emulation capability, two additional terminal models and a voice-recognition feature that reportedly pro-vides an alternative means for entering data into Tandem processors.

Tandem also introduced a 55 char./sec, letter-quality printer for the 653X series and trimmed the price of its Model 6530 terminal by \$275, a reduction of approximately

The 653X family had been slated to receive yet another product improvement - word processing capa-- but the proposed upgrade reportedly suffers from serious shortcomings and is being withheld from the marketplace indefinitely, according to a Tandem spokesman.

hancements to the 653X terminal line came on Feb. 10 during an annual shareholders' meeting at Tan-dem's world headquarters here. the release of Tandem's EM3270 communications access method, all three members of the 653X series, including the two newcomers, can now interact selectively over bisynchronous lines with either IBM or Tandem host mainframes Users can switch between IBM and Tandem processors by touching just one keyboard button, the spokesman

Implemented mainly in software, EM3270 enables the 653X terminals to emulate a wide assortment of 3270 series devices, including:

■ The 3277 Model 2. ■ 3278 Models 2, 3, 4 and 5,

3279 Models 2 and 3. ■ Models 3284, 3286, 3287, 3288

and 3289 printers.

Because the 3270's emulation software resides in Tandem's Nonstop and TXP mainframes, none of the firm's terminals can communi-cate directly with IBM processors. Instead, the display units gain indirect access to IBM applications through Tandem's CPUs, the spokes-

EM3270 complements its developer's two existing access methods -TR3271, which allows 3270 series peripherals to treat Tandem hosts as 3271-type cluster controllers, and AM3270, which permits IBM-built 3270s to communicate bisynchronously with Tandem systems.

In addition to operating with the existing 6530, the 3270 emulation capability is available with the 6531 and 6532, the two latest extensions

to Tandem's terminal family. Unlike its older sister system, with its 15-in. monitor, the 6531 has a 12-in. display screen and is suited primarily for decision-making applications and 'what-if" queries, the spokesman said.

The 6532, by contrast, comes with a 9-in. display and is aimed mainly at jobs in which desk space is at a pre-

Both 653X series additions are packaged with their electronics and monitors in separate boxes, which can be moved up to 6 ft apart from each other, the spokesman noted.

Like the existing 6530, the 6531 and 6532 support Tandem's just-announced Voice Input Option, which uses a microphone and headset to allow users to enter data simply by talking rather than by keying. tended mainly for production-floor

# See COBOL.

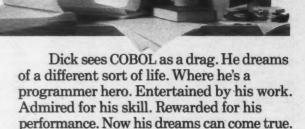
Dick is a COBOL programmer. Dick is bored. Harried. Overworked. Dick struggles with tedious

trace

debugging routines. Non-existent documentation. Mainframe logjams. Dick is four months behind schedule as a result. And users are angry about long turnaround times. They yell and make Dick upset.

They make Dick's boss





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# Array processor fits VAX | PE offers LP1200 printer

BILLERICA, Mass. - CSP, Inc. has announced the availability of a multiuser, multitasking array processor system for use with Digital Equipment Corp.'s VAX-11/780, 750 and

730 computers.
The Mini-MAP Plus 4 system consists of up to four Mini-MAP 32-bit, floating-point array processors interfaced to one VAX-11. Each array pro cessor can be accessed by a separate user with a different task requirement. Hence, the VAX-11 processor reportedly can accommodate up to four separate computationally intensive tasks simultaneously, each with 7 million floating-point operations per second.

The basic configuration includes the four Mini-MAP array processors, each with 64K bytes of memory and DEC Unibus interface cabling. The unit is packaged in a single 101/4-in. chassis suitable for mounting in a

Larger configurations, including up to 16M bytes per Mini-MAP, are o availabl

Also, the Mini-MAP Plus 4 system provides software development tools omprising the Scientific Subroutine Library of more than 225 algorithms The basic configuration is priced

at \$78,700.

CSP is located at 40 Linnell Circle, Billerica, Mass. 01821.

OCEANPORT, N.J. — Perkin-Elmer Corp. has introduced a highspeed band printer for use with its line of 32-bit superminicomputers.

The LP1200 is said to offer 80 or 132 columns of solid character font printing that produces hard-copy on standard single-page or fan-fold paper.

The unit plugs directly into any PE Series 3200 superminicomputer and reportedly offers features that reduce setup time and maximize printer operation. Other features include a horizontal forms adjustment system, switch-selectable standard vertical spacing for 6 or 8 line/in., an automatic power stacker, touch-sensitive control panel and a typical through-put of 1,200 line/min when using a 64-char. set. The LP1200 is priced at \$29,990

and can be ordered with either a 64-

or 90-char. set or both.
PE is located at 2 Crescent Place, Oceanport, N.J. 07757.

# TURNKEY SYSTEMS

SKAMP COMPUTER SERVICES,

Skamp Computer Services, Inc. has introduced an entry-level turn-key system for distributors.

The system is based on a Texas In-The system is based on a Texas Instruments, Inc. microprocessor and includes two TI Business Systems video display terminals featuring 256K bytes of memory, 17M bytes of disk storage, a 1.2M-byte diskette drive and a desktop printer that prints at a rate of 150 char./sec. It is expandable up to seven terminals.

The software, called Skamptrak, reportedly combines order entry, inreportedly combines order entry, in-ventorly control, purchase order, sales analysis and sales commission-ing with general ledger, accounts payable and accounts receivable.

Skamptrak costs about \$20,000, including installation.

Skamp Computer Services, 10261 Yellow Circle Drive, Minneapolis,

# **DATA STORAGE**

INNOVATIVE DATA TECHNOLOGY, INC. Magnetic tape subsyste

Innovative Data Technology, Inc. (IDT) has introduced two 1/2-in., 9-track, 800 or 1,600 bit/in. magnetic tape systems for the Mostek, Inc. Prolog STD bus line of single-card com-puter systems. The subsystems meet the requirements of IBM, the American National Standards Institute, the European Computer Manufacturers Association and the International Standards Organization.

The tape subsystems reportedly utilize an intelligent microprocessorbased controller (requiring a single STD bus slot) providing an 8-bit bidirectional parallel interface. Fea-tures include asynchronous handshaking, ping-pong buffering, front-end random-access memory buffers to 32K bytes and over 40M bytes of unformatted data storage for archival and/or disk backup.

A software sample application driver is supplied with the IDT mag-

netic tape subsystems.
The Series TD 1050/STD, a 45 in./ sec system, is priced at \$9,575; the Series TD 1750/STD, which operates

at 75 in./sec, costs \$11,950. IDT, 4060 Morena Blvd., P.O. Box 178160, San Diego, Calif. 92117.

EMULEX CORP. SC72

Emulex Corp. has announced a controller designed to allow intermixing of disk drive types on Digital
Continued on page 62



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Continued from page 60 Equipment Corp. PDP-11/70

minicomputers.

The SC72 is said to operate on the PDP-11/70 cache bus using standard system software, diagnostics and embedding in place of DEC's RH70 controller.

The SC72 reportedly integrates into a single system any four industry-compatible disk drives operating at data transfer rates up to 2M byte/sec. According to the company, data packs are compatible and interchangeable between DEC RM03 (67M-byte), RM05 (256M-byte) and RP06 (174M-byte) drives and their compatible disk drive subsystems.

The RH70 emulation reportedly allows softwaretransparent operation under DEC's RSTS-E, RSX11M, RSX11M-Plus and other DEC operating systems.

The SC72 is available now and is priced at \$7,950.

Emulex, 3545 Harbor Blvd., P.O. Box 6725, Costa Mesa, Calif. 92626.

#### **TERMINALS**

INFORITE CORP. Inforite intelligent terminal

Inforite Corp. has announced a hand-written character-recognition terminal said to incorporate the functions of dynamic character recognition, mark/sense recognition and graphics capabilities.

The Inforite intelligent data entry terminal is said to input information directly from handwritten business forms while maintaining a hard copy of the original. It features a two-line by 32-char. LCD display, error messages and a programmable calculator function and accommodates three-part forms.

Operating independently of a host computer, it is based on the Zilog, Inc. Z80A microprocessor and contains 64K bytes of random-access memory (RAM), 56K bytes of read-only memory and 48K bytes of battery-backed Cmos RAM. Inforite costs \$2,000 in single-unit quanti-

Inforite, Suite 201, 1670 S. Amphlett Blvd., San Mateo, Calif. 94402.

#### DATA GENERAL CORP. Dasher D220

Data General Corp. has introduced an addition to its Dasher workstation line, said to be a color, alphanumeric video workstation for data and word processing operations.

The Dasher D220 is compatible with earlier Dasher models and offers programmable color features. It has a palette of eight colors and allows the user to select up to 64 foreground and back-

ground color combinations on a character-by-character basis, the vendor said.

The video workstation is supported by a number of operating systems and two operation modes: DG proprietary (7- and 8-bit modes) and Ansi compliant (X3.4, X3.41 and X3.64 modes). All modes are switch- and software-selectable.

The Dasher D220 is available in two packages: a monitor, keyboard and cables configuration for \$2,210; or a monitor only for \$1,895.

Data General, 4400 Computer Drive, Westboro, Mass.

#### MSD SYSTEMS, INC. PSC-1

MSD Systems, Inc. has announced PSC-1, a retail point-of-sale terminal that uses a Zilog, Inc. Z80 micro-processor.

PSC-1 can function as a

stand-alone unit or can be tied into a network, according to the vendor. The PSC-1 features a security program, density studies by the hour and department, inventory polling, product analysis and calculations of profit per square foot, the vendor said.

The unit sells for \$3,895. Suggested options include a dual disk drive for \$2,590 and a report generator which costs \$995.

MSD Systems, Suite 206,

10031 Monroe Drive, Dallas, Texas 75229.

## PRINTERS/ PLOTTERS

VERSATEC, INC. Disk-based plotting systems

Versatec, Inc. unveiled optional 40M- to 140M-byte, 5¼-in. Winchester disk drives for its random-ele-



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ing interface programs.
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two non-database systems.
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We call it "Whole Person" software because it is the most comprehensive, technically advanced set of human resource systems avail-

ment processor and IBM-compatible on-line plotting controller. The disk options are said to enable Versatec on-line electrostatic plotting systems to handle longer, more complex plots in color or black-and-white with less CPU overhead.

The disk drive is available as an option with new systems or as an upgrade in existing installations. Acting as a raster data buffer, the disk drives spool the raster image for a high-speed transfer to the plotter. On-line electrostatic color plotting requires the disk option and the firm's Versaplot color random software, which provides for eight line colors and 256 predefined area colors. Also supported is black-and-white plotting.

plotting.

The disk option adds \$13,500 to the price of a random-element processor or IBM plotting controller; add \$1;500 for in-field upgrades

to existing systems.

Versatec, 2710 Walsh Ave., Santa Clara, Calif. 95051.

### GRAPHICS SYSTEMS

AUTOGRAPHIX, INC. Autographix 200

Autographix, Inc. has announced an on-site workstation and automated business software package developed to design and produce highquality presentation graphics for business.

Autographix 200 is said to produce high-resolution 35mm slides, color overhead transparencies, 8- by 10-in. color prints, black-and-white or color hard copy and video, electronic boardroom visuals.

The system is based on IBM's Personal Computer XT microcomputer and can function as an independent graphics system or as the nucleus of a graphics network for IBM Personal Computers and Apple Computer, Inc. microcomputers, according to Autographix.

Standard features reportedly include Autographix Guideline and Polycurve software, a graphics display processor, a graphics tablet and interface for creative work, Epson America, Inc. printers and a Hayes Microcomputer Products, Inc. Smartmodem.

An option is the Matrix Instruments, Inc. QCR film recorder, which produces 2,000 to 4,000 pixel/line slides onsite.

Normal slide needs and alide overloads can be transmitted over telephone lines to Autographix production centers for delivery of finished slides in five to 24 hours, according to the company.

pany.

The system is available now. The basic system is priced at \$35,500. The optional camera is priced at \$32,000.

Autographix, Citicorp Plaza, W. Bryn Mawr Ave., Chicago, Ill. 60631.

# CATRONIX CORP.

Catronix Corp. has introduced a stand-alone, turnkey engineering workstation for mechanical design.

According to the vendor, the Petcat desktop system is the first mechanical design workstation for computer-aided engineering that is not a superminicomputer or a remote terminal to a mainframe computer.

The workstation is built around the IBM System 9000, a laboratory-oriented microcomputer based on the Motorola, Inc. 68000 microprocessor, and three of the vendor's software programs: Catsolid, a three-dimensional solids-modeling system; Catfem, a finite-element modeler; and Catface, an interface to finite-element analysis programs, the vendor said.

The price is \$28,500 for a system comprised of a System 9000 with 1M byte of memory, 20M-byte Winchester disk, 8-in. floppy disk, IBM graphics screen, 16-color raster display and Catsolid and Catfem software, a vendor spokesman said.

Catronix, 120 Ralph McGill Blvd. N.E., Atlanta, Ga. 30308.

#### RASTER TECHNOLOGIES, INC. Model One/80; Model One/10

Two enhancements to the Model One line of graphics systems were announced by Raster Technologies Inc.

Raster Technologies, Inc.
The Model One/80 graphics system features a 1,280-by 1,024-pixel resolution, a 60Hz refresh rate and a pixel Continued on page 84

able. InSci started the HRS industry back in 1965, and we've led the field ever since. Our technical experts have provided you features unmatched by any other company.

unmatched by any other company.

Modularized Design For Easy Maintenance.
InSci "Whole Person" software was designed from the top down and is highly modularized, providing maximum flexibility. A single module or subroutine supports each specific function in the system.

User Exit Routines. Strategic areas built into the InSci system allow

Payroll

Claims

into the InSci system allow exits to override the standard system routines. This means you can add your own programs without changing database system codes. InSci also gives you source codes so you can go into the system directly if you desire and still receive maintenance.

Preliminary or final pro-



RE. THE FIRST SOFTWARE L THE NEEDS OF THE DP

cessing mode. InSci systems let you select the most efficient operating mode for each processing task. All changes can be processed in real-time, so they become effective immediately. Preliminary processing allows for simulating situations such as a payroll run without affecting the database. And, of course, InSci systems provide state-of-the-art security precautions, complete maintenance support and training.

#### Write us. Or Call.

InSci "Whole Person" software—for more information, write us or call: Information Science Incorporated,

95 Chestnut Ridge Road, Montvale, New Jersey 07645. Attention: Chris Hanavan. 201-391-1600.

InSci WHOLE PERSON SOFTWARE.



Continued from page 63 update rate of up to 8.7 nsec per

The Model One/10 offers a 640- by 480-pixel resolution and a 60Hz refresh rate. Both products use the firm's proprietary very large-scale integration (VLSI) microprocessors, a spokesman said.

The Model One/80 combines a 16bit microprocessor, a bit-slice processor and proprietary VLSI accelera-tors. It draws more than 70,000 one centimeter random vectors per second, and a double-buffering feature provides vector drawing rates up to 115M pixel/sec.

The unit was designed to operate with 32-bit workstations and proces-The unit costs \$18,950 for a 1,280- by 1,024-pixel resolution system with eight planes of image mem-

ory, cabinet, monitor, keyboard and local firmware, the vendor said.

The Model One/10 uses a 16-bit microprocessor and proprietary VLSI processors to achieve a vector writperformance of 1M pixel/sec. VISI hardware performs image memory refresh and timing, video refesh and hardware vector clipping and picking. The Model One/10 offers local display and Digital Equipment Corp. VT100 terminal capabilities. The unit costs \$7,995 for 10 planes of memory, monitor, keyboard, all firmware, local display list and program development software, the vendor

The Model One/80 is available immediately, the Model One/10 will be available in April, according to the vendor.

Raster Technologies, Executive

Park Drive, North Billerica, Mass.

ENGINEERING AUTOMATION SYSTEMS EAS/700 Series enhan

**Engineering Automation Systems** has announced enhancements de-

signed to increase the on-line storage capabilities of its EAS/700 Series graphics system

Enhancements include a 46.3Mbyte Winchester disk drive and an increase in central processing memory

to 1.5M bytes.

The EAS/700 is an engineering workstation featuring Microsoft, Inc.'s Xenix operating system and Engineering Automation's PCX printed circuit-board design software and OAX documentation software. The enhanced version is available now.

The color system is priced at \$48,450, and the monochromatic system costs \$40,750. A system with an eight-color plotter, matrix printer and 1,600 bit/in. magnetic tape drive costs about \$84,000.

Engineering Automation Systems, 936 Silas Dean Highway, Wethersfield, Conn. 06109

CASCADE GRAPHICS DEVELOPMENT, INC.

Cascade Graphics Development. Inc. has introduced a high-resolution computer-aided design and drafting (Cadd) system, the Cascade X.

In addition to the standard 12-in. monochrome CRT terminal, the Cascade X features a 19-in. nonglare monitor that reportedly provides 1,024- by 798-pixel resolution, dual monitors and Motorola, Inc.'s 68000 microprocessor. The system includes 756K bytes of random-access memory, which the vendor claims offers nearly instantaneous processing of graphics input. Up to eight workstations can be used in a network with the Cascade X, the vendor said.

The vendor said the Cascade X is compatible with older Cascade products, as the products are totally com-

patible.

The Cascade X system also includes a CPU, keyboard, tablet, joy-stick, 5M-byte hard disk storage ex-pandable to 80M bytes and a double-sided, 5¼-in. floppy disk drive for inputting Cascade software and updating or storing drawings. Asize through E-size plotters and a dot matrix printer are optional.
The Cascade X costs \$30,000.

Cascade Graphics Developm 1000 S. Grand Ave., Santa Ana,

**POWER SUPPLIES** 

DYNAFIVE CORP. Dynaswitch; system enclosure

Dynafive Corp. has announced a current-controlled switch and a system enclosure for Digital Equipment Corp. and compatible products.

Dynaswitch is designed to minimize interference and current surges, sense the on/off condition of ac pow er to the master outlet and control the ac power to the switched outlets.

The system enclosure is said to feature a 40A switch-power supply; an eight-slot quad backplane; six communications ports, mounting for a 514-in. Winchester disk drive; and dual or single 514-in. half-height flop-

py disk drives or backup tape. Both products are available now. Dynaswitch is priced at \$133, although quantity discounts are avail-

The enclosure is priced at \$1,270 for a rack-mount model, \$1,520 for a tabletop model and \$1,770 for a pedestal model, with quantity discounts

available for all three models.

Dynafive Corp., 12040 Western

Aws., Garden Grove, Calif. 92641.

TOPAZ, INC. Maximum Value Powercenter

Topaz, Inc. has announced the availability of its Maximum Value Powercenter (MVP) featuring its single-point grounding.

The MVP reportedly distributes



power throughout a computer room while protecting computer circuitry from powerline noise. Features in-clude flexible, watertight, shielded cables; 126 pole positions; digital system-status monitoring secondary main-circuit breakers; a ground-fault interrupt; and a building-alarm inter-

face package as standard equipment.
The units are reportedly 98% power-efficient and are available in power ratings of 100-, 125- and 150 kVA, the vendor said.

MVP units range in price from \$12.635 to \$14.770.

Topaz, 9192 Topaz Way, San Diego, Calif. 92123.

fined specifications.

According to Science Dynamic, the Rdas includes self-test, diagnostic and reporting capabilities.

and reporting capabilities.

Prices start at \$1,940 for ACT 16,
\$3,150 for ACT-LIBR and \$38,215
for the Rdas. Delivery, according to
the company, is 90 to 120 days after
receipt of order.

Science Dynamics, 1919 Springdale Road, Cherry Hill, N.J. 08003.

# SUMITOMO ELECTRIC USA,

al Seanner Bar-Code

Sumitomo Electric USA, Inc. has introduced the Personal Scanner Bar-Code, a hand-held bar code reader.

The product reportedly reads dif-ferent styles of bar code fonts, in-cluding NW-7, UPC, EAN and JAN

fonts. The Personal Scanner Bar-Code interfaces with a number of products, including IBM terminals, the vendor claimed. The bar code reader is available as an integrated or stand-alone product.

The Personal Scanner Bar-Code is

Sumitomo Electric USA, 551 Madison Ave., New York, N.Y. 10022.

#### SENTEC, INC. System II

For VSAM Dataset Management

AUTOMATI

Sentec, Inc. has announced a security system designed to protect computers from 14 environmental, pow-er-line and security threats.

System II reportedly offers monitoring and reaction protection from overheating, transients, power interruptions, humidity, loss of phase,

The Gual News

smoke and airborne particles, brown-outs, power-line fluctuations, phases

out of sequence and water.

The system was designed to cut power to the computer when dangerous conditions exceed manufacturerspecified parameters.

It is said to feature LED status indicators, audible alarms and a remote status-slave module. That module is designed to allow personnel at a remote station to respond to fault con-

ditions and alert support personnel.

It is said to allow interface with an automatic telephone dialer, which can dial preprogrammed numbers with status mess

The System II is available now at

prices starting at \$13,600. Sentec, 1265 N. Dutton Ave., Santa Rosa, Calif. 95401.

## **BOARD-LEVEL DEVICES**

#### OMNIBYTE CORP. OB68K/MMU

Omnibyte Corp. recently announced the OB68K/MMU, a largesystem CPU board providing hardware memory management for multiuser systems and other applications requiring protected segments of

The board features the Motorola, Inc. 68010 processor with temporary internal register storage and process retry upon receipt of a bus-error signal, delayed bus-error handling for error detection and correction and virtual memory capabilities.

The Omnibyte board provides from one to four Motorola 68451 memory management units partition-ing physical address space into 32 to 128 segments.

System-support functions of the product include a real-time calendar/ clock with battery backup, two RS-232 serial I/O ports, a software-definable bit/sec rate generator with 18 standard settings and one 240-bit

The board is priced at \$1,495 for a 32K-byte version and \$1,995 for a 128K-byte version.

Omnibyte, 245 W. Roosevelt Road, West Chicago, IU. 60185.

# BEATS MANUAL VSAMAID/XP<sup>\*</sup>Slashes Man-Hours From VSAM Management

Goal Systems International has developed a product called visual Manual Control of the Control o

Product Of

ew Software

Technology

A historical file of all VSAM data sets in DOS/VSE, OS/VSI and MVS acreated from VSAM performance data. Then, as crated through VSAM/SI and MVS acreated through VSAM/SI and MVS acreated through VSAM/SI and MVS acreated through VSAM/SI acreated th

parameters, allocation of virtual storage, records organization, most common access patterns, vSAMAID/XP makes its recom-mendations in the IDCAMS perime forms to simplify rede-fining each file.

# Over 200 System On Trial in First Three Months

amed as the most popular prod-ct in the history of Goal Sys-cms, VSAMAID/XP has been alphed to more than 200 sites trial in its first three months

Works With FAVER/XP® For Total VSAM Management

Goal Systems International has revealed that they have an interface between the FAV per an interface between the FAV per an interface between the FAV per Backup & Restored per and the VSAMADAY system which creates the only complete VSAM of the VSAMADAY part of the FAVER/XP of the VSAMADAY per an interface creates a historical interface proof the FAVER/XP of the VSAMADAY per commendation. VSAMADAY recommendations may ADAY recommendations may ADAY recommendations may appear to the single commendation with simple commendations may the VAVER/XP Auto-Delete/Define facility.

"It seems like all we have to do is mention VSAM and people are eager to listen; said Denny Yos. Saes Manager for the XP Prod. Saes Manager for the XP Prod.

# **AUXILIARY EQUIPMENT**

#### SCIENCE DYNAMICS CORP. Act II

Science Dynamics Corp. has announced an access-charge measure-ment device designed for telephone operating companies to use in measuring, originating and terminating traffic on trunks and lines.

The Act II system reportedly features electronic metering of the number of in and out accesses and their duration for each time period, with front-panel controls for local readout and programming and security-code protection.

The company reports that two models are available. The ACT-LTBR was designed for medium to large offices, accommodating up to 256 inputs, mixed lines, trunks and expansions in groups of 16. The ACT 16 terminal is offered for small- to medium-size offices and accommodates up to 16 line or trunk inputs.

The device is said to include data collection terminals and a remote data administration system (Rdas), a central processing unit that reportedly polls multiple terminal installations in accordance with the user's billing schedule, computes usage and formats the information to user-deCalling on its highly skilled aoftware development tean. Goal
systems international began
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# advanc deoterm

For years, Digital's VT100 terminal has been the CRT to choose if you want the most out of your computer. It has become the industry standard for reliability and ease of use. Not to mention the largest-selling ASCII terminal in the world.

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# es the standard inals. A

We've even included our most advanced video capabilities—like smooth scrolling and 132-

capabilities—like smooth scrolling and 152column display—as standard features.

All packaged in our sleek new design that fits conveniently on your desk. And all supported by Digital's worldwide service organization.

But the best news is yet to come. Because despite all the advances, the VT200 family is very

competitively priced.

Simply stated, Digital has advanced the stand-

ard. Once again.
For the full story, call 1-800-DIGITAL extension 700.

digital

# AUXILIARY from page 65

DISCWASHER

Discwasher has introduced an interactive disk drive cleaner designed to lead the user step-by-step through the cleaning process.

The Clean Runner is said to be a combination program/cleaner that safely cleans disk drive heads, avoiding problems associated with contamination.

It utilizes a lint-free cleaning surface bonded to a polyester diskette and is a dry system. Suggested retail is \$24.95

Discwasher, P.O. Box 6021, 1407 N. Providence Road, Columbia, Mo.

# RECOGNITION EQUIPMENT,

Recognition Equipment, Inc. (REI) has introduced a bar-code reader said to read and convert both humanreadable OCR fonts and bar codes into computer-compatible informa-

The hand-held input device is used to scan OCR and bar-code informa-tion interchangeably without operaintervention, according to rendor. It reads fonts, such as OCR-A Alphanumeric, Multifont Numeric and bar codes such as UPC/EAN, Code 39 and 2 of 5 Interleave

Suggested end-user price is \$1,800 a spokeswoman said.

REI, P.O. Box 660204, Dallas, Tex-

# VENDORS from page 57

period. That is what IBM appears to be doing with its MVS/XA operating system. IBM created an environment which, it hopes, will allow users to run existing programs while convert-ing frequently used applications to take advantage of the extended ad-dressing offered by MVS/XA.

Burroughs Corp. also appe be taking the same approach with its proposed A series of mainframe processors. The first model of the A series, the A 9, allows users to run existing programs developed for the B4900, B5900 or B6900 systems.

But this turtle-like transition period is occurring during a time when technology is whizzing past the older mainframe processors. Microcomputers, for example, started out as 8-bit systems that offered some rudimen-tary computing capabilities. Within two years, micros have developed into 32-bit systems that are already challenging the performance of lowend mainframe

Mainframes are not going to die out, but the dramatic advances in microcomputers may erode their importance in corporations. More segments of companies appear to be bypassing the corporate mainframes in favor of smaller systems that better fulfill their specific processing needs. That trend may improve user productivity, but at what price? Many firms are already finding that control of corporate data is slipping away. There may come a day when the micro users come crawling back to the DP shop complaining they have lost all control over how employees are using their micros.

What happens then? Will it be possible to bring everyone back into the more controlled environment of mainframe processing? Will employees want to give up the independence found in microcomputers? Can a DP department handle all the processing eds of a big corporation?
As the world becomes more depen-

dent on computers, the issues volved with managing information appear to be outpacing the technological developments that created them. The solution may be found back at square one, the mainframe processor. But this time, a mainframe is needed that does far more than just process information; it must manage an entire firm and cater to the needs of each individual within that firm. The task sounds impossible for a single machine.

# TANDEM from page 57

and similar applications in which constant manual activity hinders conventional data entry, the voicerecognition feature is implemented on a circuit board that contains enough memory to hold a vocabulary of 200 words.

Scheduled for first-customer shipment in April, the voice-recognition feature costs \$1,800. The 6531 is priced at \$2,100, the 6532 at \$1,950 and Tandem's letter-quality printer costs \$2,995. Both additions to the 653X terminal family will be avail-

able for delivery this month. EM3270 can be obtained for a one time, per-processor license fee of \$500, plus a \$20/mo maintenance charge per system. The capability is available from Tandem at 19333 Vallco Pkwy., Cupertino, Calif. 95014.



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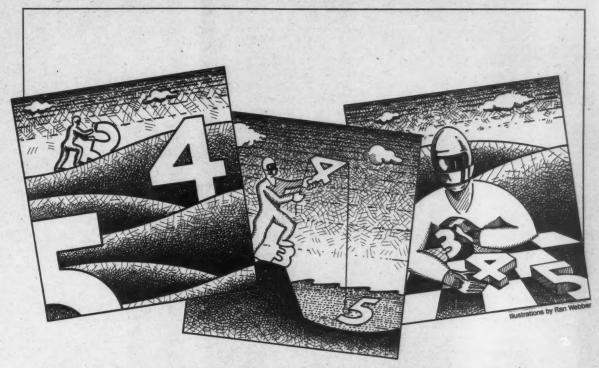
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# IN DEPTH



# Strategies for implementing fourth-generation software

# By Paul R. Hessinger

he speed and drama of technological innovation often creates confusion for a firm without a business-driven technology strategy. Part of the challenge is to separate marketing hype from technical reality. A specific new facility may be a major innovation. But does it warrant major modifications to a firm's inventory of computing resources, such as a change in an operating system?

Fourth-generation software is one of the most elusive new technologies. The term creates a gray area between major categories, such as systems and applications software. For example: Is Unix an operating system or a fourth-generation language? Die-hard technicians will suggest that even Cobol and RPG-II have a place in fourth-generation discussions. This "technocratic status quo" tendency is evidence of the necessity for a human factor orientation in an information systems technology plan.

People choose tools they are most comfortable with. They do *not* always choose the best tool for a specific task. Even the most competent "handyman" will contin-

to use a trusted tool rather than experiment. At the other end of the spectrum is the person who is always in search of an easier way, often confused with a new way. These psychological factors should be considered as fourth-generation languages are offered to "third-generation" programmers.

Powerful facilities for automated application development do exist. But even in the third generation, powerful facilities fell by the wayside — the result of indifference by technicians who were not encouraged to understand the new tools; and the result of outright rejection by users (DP and business) unwilling to play a different role in the information systems development process (for example, end users defining their requirements to an on-line dictionary facility).

Those responsible for a technology strategy must, at least for their own corporation, define: a) what a specific tool will involve in terms of processing facilities; b) what user group(s) will utilize the tool(s); and c) necessary and optional interfaces to other components of the overall technology.

It is acceptable that within a broad

In reality, business objectives, human factors and technological integration are one in the same issue — a management strategy for fourth-generation tools. More accurately, it is a strategy for more productive information processing.

### IN DEPTH/FOURTH-GENERATION STRATEGIES

category, such as fourth-generation software, specific products will have overlapping facilities. This overlap must be identified before a firm ends up with several tools that breed confusion and unproductive competition among data processing personnel and users. The rationale that the initial purchase price for a fourth-generation product is relatively low often becomes a convenient escape from the re-

sponsibility of carefully selecting and implementing it.

It is unlikely that an industry standard will be adopted in the near future for facilities that qualify a product as a fourth-generation language. Marketing enthusiasts for specific products are already "plotting" the emergence of fifth-generation capabilities. In some cases, these claims are a legitimate extension of product development efforts.

Others are attempts to promote tools that may be a little ahead of their time; our third-generation ignorance must be overcome relative to fourth-generation languages before we are ready for fifth-generation artificial intelligence systems.

A management strategy must control the temptation to take a quantum leap forward in applications development technologies. The strategy must involve a progmatic migration to new tools, no matter how powerful they may be. "Revolution" and "cultural change" are alternatives only for those corporations hopelessly mired in second-generation "swamps" (for example, running OS/MFT on an IBM 370/158 with 1401 autocoder emulation and mainly RPG and BAL applications). The technologist must develop a management strategy that considers technical is-

sues and human factors related to the technology.

#### General facilities

The following can be stated as general prerequisite facilities in a fourth-generation applications software product for a large system environment:

 a) The primary command language is nonprocedural.

b) An information/data directory/dictionary controls overall use of the tool.

c) The system software environment (for example, the operating system and data base management system) is transparent.

d) The system was designed for interactive use with significant menu-driven, prompted processing.

e) The system can be used by nonprofessional DP personnel (the type of application to be built determines the necessity of this feature; for example, operational transaction — no, ad hoc query — yes).

Clearly, a broad range of products satisfies these requirements: National CSS, Inc.'s Nomad2; Oxford Software Corp.'s UFO; Mathematica Products Group's Ramis II; Applied Data Research, Inc.'s Ideal; Information Builders, Inc.'s Focus; Cullinet Software, Inc.'s ADS/O; Oracle Corp.'s Oracle; IBM's DB2; Software AG's Natural; and Informatics General Corp.'s Mark V. Each qualifies as a fourth-generation language.

# Useful subdivision

A further challenge faced by those developing and implementing a fourth-generation strategy is to subdivide the languages into two categories:

Application (transaction processing) generators.

2) Information generators. An application generator is intended primarily for developing structured, data base-oriented, inquiry/update transaction processing application programs.

An information generator is intended primarily for applications that are not fully structured. In addition, the target applications normally involve user-defined information requirements which, in turn, involve dynamic data access paths and reporting formats.

The subdivisions will possess common facilities. The type of applications to be built and the intended user are key factors in selecting a tool from one category or the other. Without this subdivision, the "technologist" will be frustrated by three general types of rejections.

The first is the inability to aim a tool at a specific business target. For instance, the use of an application generator (the tool) is intended to reduce backlog and control programmer head count



(target) through increased produc-

Trying to build on-line transaction processing IMS capabilities with Fo-cus leads to increased head count for Focus specialists and decreased productivity of other DP personnel (in IMS data base administration, for instance) who attempt to integrate the

Moral: Powerful tool, wrong utilization with little or no business benefit. Focus is an information generator, not an application generator.

The second major obstacle that occurs if fourth-generation lan-guages are approached as a general class of software is a lack of ergonomic sensitivity.

From a technological perspective,

If relational capabilities and other facilities are arbitrarily employed as evaluation criteria, it is entirely possible that pertinent human factors will be overlooked and users will resist a tool.

the specific facilities of a given product must take into account the tended user. For example, an infor-mation generator (such as Ramis II, with its associated facility Relate) will be more user-friendly if it em-ploys a relational view of the data to be processed in a specific application. An end user requires simple data structures.

On the other hand, a transaction processing generator may be inhibited by relational-only views unless the generator is integrated with a full-function DBMS that provides for relational and other data structures (for instance, the automatic system facility with IDMS/R from Cullinet). Operational transaction processing applications often require complex data structures that are difficult to implement efficiently with relational structures. This difficulty can seriously impede the progress of data base administration and development personnel as they wrestle with the simplicity of relational structures for complex data base designs to support transaction processing.

If relational capabilities and other facilities are arbitrarily employed as evaluation criteria without the recommended subdivision, it is entirely possible that pertinent human fac-tors will be overlooked and user resistance to a tool will result. Certain classes of end users, with the proper training and support, can be productive with semiprocedural languages, particularly those that are dictio-nary-driven and prompt-oriented. In er cases, users, for aptitude or business responsibility reasons, may be unable to use any language that requires more than pushing a button (full nonprocedural).

#### Case study

Suppose a firm's MIS manager dictates that only nonprocedural tools will be considered in an upgrade of application development facilities. Most "new" applications will be enhancements to existing operational systems. An nonprocedural "application generator" is selected, but it

does not have a convenient interface to procedural languages, which are better suited to the structured portions of applications being imple mented. Programmers become frustrated because they constantly must bypass the "applications generator" as existing Cobol applications require procedural changes. Eventually, programmers completely avoid the tool.

The tool is perfect for end-user information retrieval, but was not included in a search for information center tools because "It didn't have relational or graphics facilities." Although not installed at this site, options for both existed. The tool could be better classified as an "information generator.

The application requirements dictated a fourth-generation language

with good procedural facilities. Because one was not chosen, the facility's programmers now reject fourth-generation languages in general.

#### A second case study

The third obstacle faced by the technologist will be technological disintegration. Consider a second example: An MIS manager focuses on a comprehensive fourth-generation tool with proven end-user capabilities. It has been employed to reduce significantly applications backlogs in other installations. The tool is promoted as a fourth-generation development workstation. However, the "application generator" operates only with that vendor's DBMS. Is it

worth the cost of building interfaces to the currently installed DBMS and of retraining the development staff

to support the implementation of end-user-oriented applications? Will the methodologies currently in place be modified to reflect the use of a

new tool for operational systems? Situations like this one often result in an investment of more re sources in managing rather than ap-plying the technology. A "new way" of developing operational applications may be a more comprehensive change than implementing an information generator primarily for end-

user processing.
Obviously, the selection of a new tool must involve careful analysis of its facilities and the potential impact on how other tools operate. In addition, the selection should be driven by the composition of a firm's develent backlog. When reporting applications dominate, an information

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generator will pay off. Technicians will not have to spend time building interfaces between Cobol programs and nonprocedural facilities.

The information generator should have its own "data base manage ment" facilities. This will minimize the impact on a production DBMS, such as IDMS or IMS. The interfaces the tool might have to full-function DBMS can be used as a channel to pass necessary data from production to end-user applications. Data availability does not become an obstacle.

Reverse the situation and consider the impact if an information generator is selected when transaction processing applications dominate the backlog. Even with careful planning and controlled implementation, tech-nicians will fight the technology. When the tool does not fit the type of

Consider the impact if an information generator is selected when transaction processing applications dominate the backlog. Even with careful planning and controlled implementation, technicians will fight the technology.

information processing task being addressed, development personnel will attempt to build their own interfaces between the fourth-generation language and conventional tools. The "promise" of those languages begins to disintegrate.

#### Target users

Application generators are repre sented by products such as ADS/0, Ideal, IBM's ADF II (between the

third and fourth generation?) and

Information generators include Focus, Artificial Intelligence Corp.'s Intellect (fifth generation?), Nomad2 and Ramis II.

In the background, the architecture of products such as IDMS/R, IMS/DB2 and Datacom/DB is a key parameter for effective technological integration of fourth-generation lan-

A specific organization considering fourth-generation tools could develop an expanded list of technical prerequisites for each category of these products. Relational views of data, graphics facilities, the ability to merge data with text and so on vary in relevance based upon the category being considered. For example, application generators probably do not need graphics but should have automated documentation, which is facilitated by text processing.
One Fortune 100 MIS organization

used the following list of evaluation criteria as it searched for an applications generator:

General environment:

How does the product perform in spect to resource usage

Response time.

Storage overhead. How many customers are using it?

How long has the product been around? What percentage of on-line application development is done with this tool?

Is 24-hour customer/technical

support available?
Can this tool "talk" to the installation dictionary? Does it have its

How much education is available? Is there a relational data base available that is integrated with the tool? Can this product be used without a relational data base?

Is user security adequate? Is system security adequate? Programming/technical con-

Any batch submission necessary?

For screens.For test files.

For procedural code (precompiler)

Is the end source language Cobol or tool-related? (Is maintenance done in current technology?)

Where is source stored?

■ Installation library.

■ Secure areas within the tool. How is DBMS navigation handled? (Other access methods?) Are data base control blocks defined to the tool or to each application developed on the tool?

Are color CRTs supported? 132character terminals?
Are PL/I or Cobol exits applica-

How long does installation take? What kind of personnel resources does it take to install and maintain?

How much on-line documentation help is there? Are the manuals online? Are reference cards available? How long does it take for a programmer to become productive?

How flexible is the procedural code?

Can it be used for prototyping? Is the prototyping effort transferable to the production version?

How good are the editing facili-

- Copy previously written code? Field/line/program easily modi-
- Copy/rename?
- Sequencing used or available?
- Scanning facilities? **■** Temporary versions?
- Full-screen editing support?

System concerns: How extensive is recovery from hardware failures?

What is the extent of ongoing maintenance and reorganization? How and where does it run? How are backup and restores handled?

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At the highest level from a human-factor standpoint, the subdivision provides the opportunity to se-lect a tool well suited to the task. If end-user report generation is the task, let the end user evaluate a tool on a trial basis. Imagine an end user being asked to generate an applica-tion with ADF. That kind of situation has come up as MIS departments are caught in the fourth-generation language "gold rush."

The recommended subdivision, perhaps somewhat arbitrary, would prevent this situation. Applications generators are DP tools; information generators are end-user-oriented tools. At the very least, the recommended subdivision is a start for an

While the workstation environment is also applicable to end users, it should be a prerequisite for a fourth-generation language geared to the professional systems developer.

organization trying to develop a fourth-generation language strategy.

From an ergonomic perspective, when end-user fourth-generation languages are being considered, perhaps defining "end user" in your corporation is a logical starting

There are two essential "human factors." First is the nature of the brain. Short-term memory is often used in information processing tasks, and long-term memory is used in analytical, information retrieval-oriented tasks. Consider the question: Where would I look for a list of

current customers?" Long-term memory is scanned as a person tries to remember where the information

may be stored.

Preparation of a report is a processing-oriented task. If a fourth-generation language is to be used by an end user, the language must take into account a very limited shortterm memory capacity. Psychologists studying human beings as a form of "information processor" have estimated short-term memory capacity as seven plus or minus two "chunks" of data. In a request for a report, an end user would probably need to define in his short-term memory at least the following:

Name for the report.

Where the data will come from.
 Basic fourth-generation lan-

guage command(s) to be used to re-

quest the report.

If each item is considered as a chunk, the limits of short-term mem ory are not exceeded. If a user could enter "Report 'Current Customers' from Customer File," then this fourth-generation language would surely be user-friendly.

It is what happens next that de-termines if the product is ergonomically sound. If the fourth-generation language prompts the user for other parameters (for example, lines per page) and uses standard information (such as file layout for master files), then short-term memory capacity is efficiently used for processing tasks (defining specific fields of data re-quired). It is not cluttered with items from long-term memory, which remains an analytical tool.

The technical facilities of the product must consider that a user will be involved in other tasks as he employs a fourth-generation language. A limited number of commands, an English-like syntax and short- and long-term memory "assists" (prompts, dictionary) are examples of favorable ergonomic capabilities in an end-user-oriented fourth-generation language.

The second major human factor, of course, is the user's interface to the fourth-generation language. Two extremes are desirable — English language and pushbutton. In the first, a user formulates a request as if he were talking to another human. (Intellect is a leading product on the market in this respect.) In the second, a user selects options from a menu by depressing a key or

touching the screen. IBM's dialogue management facility is based upon this concept. An end-user-oriented fourth-generation language will benefit ergonomically from a combination of the two.

A user should not be expected to learn a new language (nonprocedural or otherwise) for defining the information he requires.

Fourth-generation languages for DP professionals — application generators — will benefit from architectural attention to the same human factors. In addition, the comparison of an application developer to an engineer identifies another key ergo-nomic factor. The development of an on-line transaction processing application involves a number of distinct

1) User requirements definition.

2) Initial screen format definition.

3) Data requirements definition.
4) Translation of 1 and 2 into

control blocks."

5) Procedural code generation. 6) Controlled interactive testing.

7) Installation into production environment.

8) Documentation.

The "application engineer" should be able to reference common compo-nents such as a data base segment layout from a "parts data base." The application generator should permit the developer to proceed through the various tasks without interruption. Ergonomically, fourth-generation language must provide a workstation environment. Ideal from ADR is a good example of this concept.

While the workstation environment is also applicable to end users,

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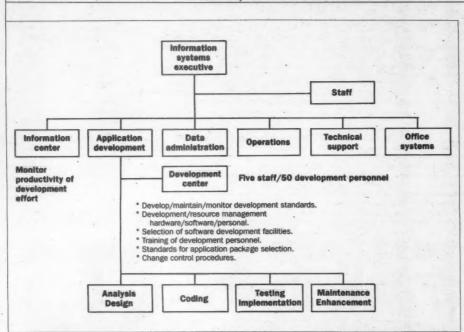


Figure 1. The development center must be a centralized function. Other tasks can be divided to suit the business.

it should be a prerequisite for a fourth-generation language geared to the professional DP developer.

In reality, business objectives, human factors and technological integration are one in the same issue: a management strategy for fourth-generation tools. More accurately, it is a strategy for more productive information processing activities.

A final case study demonstrates the interrelationship of business, ergonomic and technological issues. Senior management of a financial

institution commissioned a corporatewide productivity improvement project. MIS was instructed to take the lead in the effort and focus at tention on its own operation. A DP staff attitude survey indicated that development personnel felt severely underequipped to do their job. The battle cry was: "We need a fourthgeneration language

In the background was an overall employee feeling of "occupational claustrophobia." In a corporatewide survey, 89% of all-employees indicated the working environment was an inhibitor. It had become a business issue because of very high turnover. Fifty-six percent of management personnel indicated that availability and accuracy of information was a problem.

MIS management was convinced that a programmer productivity system was a necessity. A consultant was retained to perform a productivity audit and recommend a specific

application generator.
The consultant reviewed the work habits of development personnel. A common problem surfaced, Design review meetings with end users were held in cramped conference rooms or in the cafeteria. Programmers had to travel long distances to find an un-used terminal. In several areas, six to 10 terminals were located in one small room with little or no desk space. In most cases, the room had no windows (at least none were visible through the dense smoke).

The consultant's study concluded that the overall work environment must become more sensitive to human factors. Meeting areas were ea tablished specifically for design reviews. The technical staff's work area was redesigned. Gradually, a migration to an application generator and an end-user fourth-generation language was undertaken.

The environment is now ergonomically sound. The application generator selected is terminal-intensive. MIS management recognizes this fact, and in line with the environmental improvement program, the majority of development personnel have a dedicated terminal available

End users are not particularly self-sufficient. An "end-user computing facility" (information center) has en built and staffed with full-time DP personnel trained in the use of the end-user fourth-generation language. The technicians help the users, being careful not to become a new breed of programmer.

The facility is located next to the data administration group. Data analysts were frequently involved in first-time consultations with users of the fourth-generation language. Data availability is addressed before commitments are made to a user and before a user begins to demand that which is not readily available.

A year after the migration began, the major problems identified in the

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attitude survey have been overcome, as reflected in a new survey.

#### Backing up management

In addition to the technology being considered from a human perspective, a management strategy must also include clearly defined organizational responsibilities for fourth-generation tools. If the recommended subdivision of fourth-generation languages is applied, then application development centers and information centers become natural "homes" for each category of fourthgeneration language.

Without the subdivision, the ap-

Without the subdivision, the application centers may end up "competing" with information centers for new tools. Generally, application generators are best suited to the former environment, information generators to the latter (end-user oriented) environment.

These organizational entities are also essential in a human factor-oriented fourth-generation strategy. Application development center and information center "consultants" must realize that marketing the new tools is as important as, if not more important than, understanding the new tools.

A programmer will accept an application generator much better if the application development center consultant understands the tool and is sensitive to a programmer's uneasiness with the new technology.

As with any new technology in a business environment, an organizational entity must be assigned the responsibility for the ongoing support of new tools. Without this responsibility, a management strategy may be disabled by the very tools on which it is based.

#### Complementing technologies

It is often difficult to separate human factors from management strategies as fourth-generation languages are investigated. Simply being conscious of one may lead to the other. Another approach, if ergonomics and strategies have been overused in your environment; is to consider implementing techniques along with the new tools that together will define a fourth-generation methodology for information systems development.

Prototyping is perhaps the most publicized fourth-generation methodology. At its most fundamental level, it is a technique for more effective end-user information requirements definition. Successful implementation of the technique, however, requires a balanced emphasis on the three elements that have been the focus of this discussion—business orientation, ergonomic sensitivity, technological integration.

By definition, a prototype is the first thing or being of its kind, an original working model. Prototyping, then, is the development of the original, working model. Clearly, the development of a prototype requires at least three components:

■ A statement of requirement — what is the model to do?

"Manufacturing resources," which facilitate the engineering of the prototype.

■ An environment for testing the "first thing or being of its kind" which approximates, if not duplicates, the working environment of the end product.

The development of simulations and prototypes is a design catalyst.

In reality, technological and economic barriers inhibited the generation of simulations and prototypes in conventional operational business system development. The system development life cycle became more and more bureaucratic as organizations attempted to control the process better and assure a higher quality product.

The techniques result in tangible entities which translate concept into requirements into general design into detail production specifications. In a past implementation environment, the techniques are valuable control points for maintenance and redesign.

This process is an engineering life cycle. In theory, it is the way in

which data processing systems are built. "Third-generation" system development life cycles suffered from too much preaching about and too little practice of:

little practice of:

User-defined and approved system requirements.

User participation in design reviews.

Change control procedures to

Change control procedures to avoid unwarranted "corrective design."

In reality, technological and economic barriers inhibited the generation of simulations and prototypes in conventional operational business system development.

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The system development life cycle became more and more bureaucratic as organizations attempted to control the development process better and assure a higher quality end product.

The promise of fourth-generation languages? A cost-effective means of implementing the simulation and prototyping concepts.

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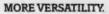
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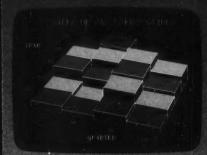
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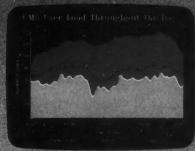
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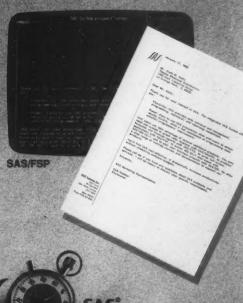
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for example, a simulation should be developed to refine user requirement statements and to establish an initial architecture for implementing the application. The simulation is developed interactively, focusing initially on external capabilities and then proceeding to processing flow. User involvement in the simulation process is key.

However, there is a catch-22 to simulation. Users see what they want and they want it delivered quickly. But the simulation isn't a working system. Do you bore or intimidate your users with the necessity for detailed program specifications, data normalization and data base design? No — you move forward with the application engineering effort (see Figure 2).

Prototype development follows

the simulation effort. The detail design of the application begins to take shape. But the prototype begins to deliver basic functionality to an end user. Once the prototype has been implemented and perhaps refined, a detail design can be "frozen." Production application development can then begin. This might involve fine tuning the current prototype. In certain cases, it might involve a major effort to produce an application that will operate efficiently in high-volume processing environments. The prototype typically will not involve integration with other major applications.

"Application engineering" is a reorientation of a third-generation development life cycle that incorporates the distinct techniques of simulation and prototyping. The benefits? Applications that can be engineered faster with fourth-generation languages, with a higher degree of end-user satisfaction and business impact as a result of the emphasis on user defined requirements.

Skepticism about the feasibility of these techniques arises from two major misconceptions. The first is that in a typical IBM mainframe environment, there is not a single software product that enables the implementation of the simulation/prototyping techniques. The second is that the techniques are not applicable to large on-line data base systems; the misguided assumption is that prototyping is a euphemism for end-user computing.

Products such as Ideal and IDMS clearly offer the promise of fourth-

generation languages to major operational system development projects. Benefits will be attained based upon a carefully directed use of the technology. Prototyping in this context is a strategy for the successful use of fourth-generation products.

If you work in an IMS installation, don't despair. There are products that enable the implementation of

these techniques.

The subdivision of "fourth-generation language" into applications generators and information generators is directly related to a successful implementation of simulation/prototyping. When functionality, efficiency and long-term viability are the dominant business design criteria for a major information system, a formal, rigorous approach is mandatory. Application engineering with a heavy dose of simulation and prototyping mixed with conventional techniques is such an approach. A fourth-generation language application generator will be the enabling technology.

When discussion of a new information system centers on "end-user involvement," "throw-away system," "decision support" and "ad hoc specifications," prototyping is not a miracle solution. An information generator will probably be the enabling technology. In this context, a rigorous methodology is not required and, if applied, probably would be an inhibitor.

Prototyping is synonymous with a management strategy for effective requirements definition for major business information systems.

If prototyping is casually embraced as a replacement for thirdgeneration structured techniques
and bureaucratic system development life cycles, then it will remain a
mystery if not give way to mayhem.
To be sure, the fourth-generation
tool will be blamed if productivity
does not improve: "The tool just
wasn't the right one for prototyping
— the end user couldn't figure out
how to use it." The strategy for
fourth-generation language must include a revised approach for requirements definition. Prototyping is a
technique for that.

The ability to develop prototypes becomes another evaluation criterion. But prototyping will involve different characteristics in transaction processing vs. information-oriented applications. Seldom will an application generator produce prototypes for end-user-oriented applications. The reverse is also true.

#### Degrees of development

It must also be realized that prototyping will be used in conjunction with conventional approaches to systems analysis and design. In some cases, a developed prototype may deliver 96% of the required processing. In other cases, it will only scratch the surface. In the latter case, prototyping must be viewed as the tip of an iceberg — a fourthgeneration systems development life cycle. In this context, "prototyping" is synonymous with a management strategy for fourth-generation languages.

What then are the keys to the resolution process that will translate fourth-generation tools into business benefits?

First, commit to the development of an information systems technology strategy. Establish at least one full-time resource (call the person



"director of technology assessment") with the ongoing responsibility for the strategy. The person will not be an expert in every area of technology, but through research, will identify technology alternatives and then look to specific areas within the MIS organization to assist in detail evaluations.

Second, classify and understand the technology. The primary technology focus of this discussion was on fourth-generation languages. Subdividing those languages into application generators and information generators permits a more manageable evaluation of the facilities and requirements of specific products.

Third, do not overlook the fact that the new tools may require new techniques to guide the initial and ongoing utilization. Techniques such as prototyping reinforce the subdivision of fourth-generation languages. Prototyping may be another base for end-user computing if the right tool is selected for information generation. In other cases, prototyping will require a transaction processing generator to facilitate requirement definition for production applications.

Fourth, and perhaps most impor-tant, consider the people who will use the application and information generators. Involve them in the selection, train them in the implementation and monitor and support their utilization of fourth-generation language. The application development er and information center are the functional areas that will translate the technology strategy into a tactical plan for the effective use of

fourth-generation language.
Fifth and finally is an issue that has been transparent to the discussion thus far. In a specific organization, basic business data is relatively stable, while associations between data can be dynamic. New information requirements may involve dif-ferent levels of summarization and/ or different combinations of the basic data. The development of a data architecture for a business imple ments the data base concept in a very pragmatic way. The data architecture will identify what data is necessary for a business, where it is and how it is used and will assist in establishing controlled access to data from a wide variety of processing tools, including fourth-generation

#### About the author

Paul R. Hessinger is director of Advanced Technology Research for Computer Task Group, Inc. in Buffalo, N.Y. He conducts approximately 125 professional seminars annually. Among those last year were "Pro-grammer of the Future: Person or Machine," a featured presentation at International Association for Systems Management Conference in Boston, and "The Fourth Generation Blueprint for a Data Base Environ-ment," for the International Data Processing Management Association conference in Baltimore.

Hessinger lectures for organiza-tions such as the Gartner Group on strategic planning and the future di-rection of information systems tech-

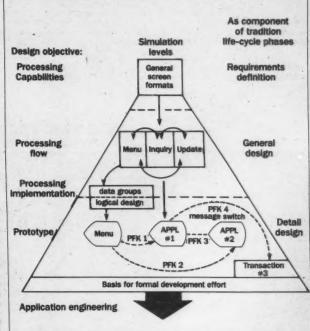


Figure 2. Multiple levels of the simulation are maintained during the design process. Throughout the development life cycle, any requested changes can be evaluated at the highest level to assess impact fully.

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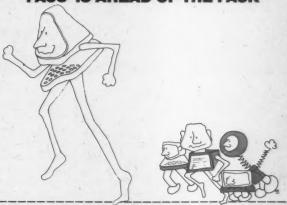
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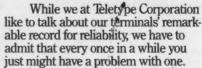
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# IN DEPTH



# Roles DP managers must play

#### By Marsha Sinetar

William James, considered by some psychologists a more accurate thinker than Freud in defining human behavior, wrote decades ago that if an individual wants to change his personality, he has to change his actions.

Similarly, a manager who wants a better chance at success will benefit from acting as if a given role were natural. Large rewards come from having an adaptable personality.

Successful managers communicate like natural, if not born, actors. However, most people trained in technical fields have not learned the finesse and authority of speaking, listening to or directing a group. Being "at home" with others is not necessarily an inborn trait. The technical professional must learn a new cluster of communication skills, which takes time, patience and a lot of practice.

Management communication, linked to

the notion of life-as-performance, is not a new concept. However, as the qualifications for professional managers expand beyond just a financial strategic planning profile to include "people skills," the idea is receiving new attention. Now communication skills and management success are linked more tightly than ever.

Italian psychiatrist Robert Assagioli observed, "One of the most important and illuminating aspects of the analogy between acting and life concerns the relations between the personality of the actor . . . and the characters he sequentially impersonates, his 'mask' in a psychological sense."

Managers must play several roles in order to be successful. If their masks reflect only one side of their personality or falsely portray a warm, caring nature, they are miscast, distrusted; their attempts at communication fall flat. When employees feel the boss is a phony, his behavior is often a sign he is unsure of

A manager must wear several masks — adopt roles — to be successful. He needs to improve his communication skills as if he were perfecting a hobby or sport. There are three masks he should learn to assume, as should any entry-level manager and probably senior executives as well.

#### IN DEPTH/ROLES MANAGERS PLAY

what role to play.

A manager needs to improve his communication skills as if he were perfecting a hobby or sport. In fact, there are three basic masks he should learn to put on.

Mask 1 — The manager as administrator. How well each department head orchestrates subordinates to achieve scheduled goals makes the difference between mediocre and outstanding performance in this role Administration is the nuts-and-holts mask, the technical, organizing, planning and budget management part a manager must play.

Managers must communicate about progress, priorities and schedules. These demands require precise communication, an ability to talk about how each person's job fulfills departmental commitments. This kind of discussion sets the stage for talking about productivity, how the group and/or individuals can accomplish team goals in a systematic and orderly way.

Most managers are pretty good at the technical and organizatio pect of their roles. Retired military officers wear administrative masks particularly well, as do others who are structured, rational and self-disciplined.

A close focus on details helps employees maintain direction - time cards, expense reports, delegation of authority, responsibility and so on. For the manager-as-administrator role, communication is relatively straightforward and objective. These ssages can be put on paper. charted and graphed.

Because administrative communiques can be easily measured, the role requires an accurate reporter of

Other key management roles may be more complicated, thus more easily botched. Rarely are administra-tive managers successful in senior management roles unless they are also adept at playing other parts. If, however, an administrative type owns the company, then everyone

else must be a good actor.

Mask 2 — The manager as lead-

- Respected by fellow workers. III Independent, willing to make rough decisions alone
- takes risks.
- Responsible, persevering, energetic and enthum Optimistic, highly self-confident. Has a dominant personality, enjoys influencing others
- Has new insights into problems.
   Sees the big picture; isn't bogged down with details that bother others

- May be idiosyncratic, has the ability to stand away from the crowd, may even be a loner.

#### andership

- Words/actions bring security to the group. Speaks with personal vision.
- Speaks with pers

- Uses positive words, tone, has vigor, energy, drive.

  Motivating.
  Tolerates ambiguity, helps others do the same.
  Tolerates stress, helps others manage their stress.
  Words and actions unify the group.
  Communicates well in sensitive socil situations, has fine
  Willing to take a stand.

- Personality treits
- Communicates affection for the group.
   Speaks authoritatively and fairly, espeor uncertainty. Group's well-being tied to own well-being.

  Mature, well-developed character structure.

  Understands the psychology of authority.

  Responsible for the well-being and growth of subordinates
  - Gives ongoing guidance and feedback.

    Acts and speaks so as to guide, teach cts and speaks so as to guide, teach, correct, groom others Nords and actions show high expectations for excellent resul
- Excellent judgment calls.
   A good teacher, guide and insightful critic. Acts as a menever competes with the subordinate.
- Responsible for group/individual deficits.
   Has clear, understandable values that coincide with organizational values.
- Has positive feelings toward subordinates/superiors

#### Administrative

- Orderly mind-set.
- Acts in a timely, systematic manner.
  Technically expert, respected by group for experi
- background. Helps group solve technical problems without getting
- buried in details of the proble

  Understands the big picture.
- Able to stay within budget.
- May be perfectionistic, but doesn't insist others become that way.
- Orchestrates the team for a systematic, orderly and timely
  - goal accomplishment.

    Reminds team and individuals of schedules, progre
  - Helps group handle details of its job
  - Validates routine aspects of the job.
     Helps others grow into organized contributive

Three basic clusters of skills show the relationship between communication and management success.

er. Managers must not only be good leaders; they must also act like leaders. Few are gifted enough to play this role without training, but not many organizations provide such de velopment opportunities. This lack probably accounts for many of the ills industry has experienced in the past decade — labor-management problems, high employee turnover and apathy, absenteeism, lack of team spirit and others.

To understand the manager-as leader role requirements, it is helpful to know just what a leader is and

does. Oddly, it is the leadership dimension of a manager's performance that industry has most frequently overlooked, underdeveloped and misunderstood. All too many companies promote people into supervisory positions and then into upper man ment roles without ever considering their leadership talents.

Seniority, technical expertise, politics and other irrelevant criteria are the usual factors in promoting people to "starring roles." I've often heard young enthusiasts from my corporate client organizations say

they are "due a promotion" because they've been around a given period of time. Companies that market the "due-a-promotion" policy based on longevity are asking for mediocre managers.

There are at least 20 personality traits that go into a leader's character structure, involving maturity of thinking, interpersonal skills and outward behavior. Two years ago, I was on a select panel of social scientists and educators gathered by the California State Department of Education to see if we could identify the characteristics and behavior of lead-

Leadership was determined to de pend on both character structure and on the leader's situation. Leaders were identified as people whose ac tions and words brought solidity and cohesion to a group. Leaders were found to be skilled at pulling people together — nonleaders, on the other hand, had a disruptive effect. The nonleader increases the anxiety of the group and divides it. Anyone who has ever heard his superior communicate a new company policy in a lukewarm, apathetic or mechanical fashion understands how easy it is to separate a group from organizational goals or values.

To play the leadership role cor-

rectly, it is not enough to have a leader's personality. Because leadership is dependent upon the situation a manager is in, it is necessary to act and speak in leader-like ways in specific work-related arenas. Leading does not necessarily mean being popular (doing or saying the expected, approved-of thing). It does mean that managers who can act like leaders bring long-range unity and cohesion to all elements of their depart-

Executives possess varying degrees of talent when it comes to playing the leadership role. Some

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#### IN DEPTH/ROLES MANAGERS PLAY

managers have departments beset with problems after the merger is announced. Others continue running a smooth, business-as-usual shop, even helping subordinates cope with uncertainty, ambiguity or the possible loss of a job. These people are, without exception, leaders.

Acting or talking as a leader means a willingness to be visible, authoritative and responsible. These traits are found only in people who

Only a leader can develop leaders.
Only a person who has pulled away from the crowd and has done the personal confrontation work that is a prerequisite to developing leadership skills can inspire these abilities in others.

have cut the umbilical cord with group opinion and who are able to stand alone when the going gets rough. It takes time to develop the latent leadership characteristics in the average manager's personality, especially if the manager lacks self-confidence.

Only a leader can develop leaders. Only a person who has pulled away from the crowd and has done the personal confrontation work that is a prerequisite to developing leadership skills can inspire these abilities in others

Although American industry loves short workshops and one-day seminars because they are cost-effective and save time, it is highly doubtful that such sessions can develop leadership behaviors that stem from a strong sense of self. A developmental program conducted within an organization over a period of time is more likely to cultivate leadership talents, depending on who facilitates the program.

Many executives favor training programs because they are "safe." In a classroom situation — even if involved in team games or simulations — they can often camouflage their tendencies to avoid the rough issues. In the work setting, such camouflages are likely to be revealed over a period of time

vealed over a period of time.

Mask 3 — The manager
as parent. One of my more
distinguished and intellectual clients said to me in a
moment of utter frustration,
"I don't want to be a parent
to my staff! They're adults.
But they're driving me crazy
with their time-consuming
bids for my attention and ap-

proval. They're acting just like my own kids, but I don't want to be their father."

This senior manager reluctantly came to understand that one of his key functions is to act as a parent authority figure on occasion. That management role is one of the masks he must wear if he is to be effective. When he needs to set standards, when he wants to correct or upgrade work or simply say how he wants a matter han-

dled, he is, like it or not, stuck with a parenting role just like every other manager is. Like it or not, communication happens in the perceiver, and employees perceive managers as authority figures when certain types of communications are delivered.

The manager issues parental messages based on a right/wrong or teaching function. This part implies correction, appraisal, judgment, guidance and even nurturing. Reviewing performance, for example, is a routine part of management's job. But little, if anything, is said about the resulting parenting/teaching aspect involved in this procedure. Managers who have clear, understandable positions, who are willing to comment when work is marginal or when it is superior, can function successfully as parent figures.

Some managers, considered old-fashioned or even backward by peers, are successful because they firmly provide what their staff needs in the parenting domain. One of the most effective managers I've ever met is a woman with little or no formal education or management training. She also happens to be the mother of nine children who has realized on her own the connection between her role as a parent

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#### IN DEPTH/ROLES MANAGERS PLAY

Acting or talking as a leader means a willingness to be visible, authoritative and responsible. These traits are found only in people who have cut the umbilical cord with group opinion and who are able to stand alone when the going gets rough.

and what she does daily on the job with subordinates.

The manager who is unafraid of the parental role and who is adaptable to its communication requirements is the one who will probably avoid being victimized by subordinates. Employees respond to authority in much the same way they did to their parents. Office "complainers," for example, are typically people who received attention as children

when they complained about little things. The office "star" learned in childhood that the surest way to get love and attention from adults was to excel.

Then there are the employees who simply detest any and all authority. Some of the most difficult employees to deal with are aggressive types or passive-aggressive types who hide their anger at authority figures but sabotage direction and correction. These employees hide so much anger that they defeat themselves and others, although on the surface they are compliant.

It boils down to this: Managers may not want to be parents on the job, but they are anyway by virtue of employees' response to authority. Managers can only be fully successful when they accept and understand the psychological aspects of the parent role and communicate accordingly.

#### More managerial roles

There are, of course, other roles to be played — the manager as mediator, for example. The manager with peacemaker abilities can be a star. Most managers, however, are not natural mediators. A growing number of companies retain executive mediators who can objectively help pull diverse perspectives into a whole as they solve problems. In the process, these mediators also act as role models for those who are involved in the mediation process.

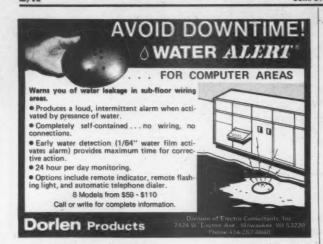
Then there's the manager-as-coach role. (Like versatile actors, the manager who fits the leader/parent role would also fit well here.) A coach must be able to motivate his staff. The manager who has coaching ability can add color, vigor and vision to otherwise dull situations. Most companies, aside from sales organizations, are short of coach/manager types. This shortage is especially acute in engineering, high-tech companies and certain legal/health-care businesses where task-orientation is the focus of communication.

Organizations rarely make clear distinctions about the variety of roles and forms of management communication. Business schools have not focused enough attention on the psychological side of management. It has become increasingly difficult to translate the word "manager" into a comprehensive term with behavioral ramifications.

However, it is still possible to enlarge the conceptual framework of the management function. By visualizing the variety of roles and the many communication nuances each mask demands, managers can become more flexible in responding.

#### About the author

Dr. Marsha Sinetar is president of Sinetar & Associates, Inc. in Santa Rosa and El Segundo, Calif. She is an organizational psychologist, mediator and futurist. Her firm provides management advisory functions to corporate top management in human resource planning and development and mediation.





INSIDE

Printers/Plotters/72

Systems/72

Board-Level

Devices/74

Equipment/74

Micro Software/75

Auxiliary

# **MICROCOMPUTERS**

# Software piracy: How serious is it?

MICRO

Over the last two or three years, few is sues in microcomputing have received more attention than software piracy. It is difficult to define the meaning of soft-

ware piracy. A narrow and somewhat legalistic approach would suggest that software piracy is the duplication of copyrighted materials for resale. But a ler interpretation may also be acceptable, namely, the reproduction of copyrighted software for redistribution regardless of whether it is for resale.

Aside from the ambiguity in its definition, the issue of software piracy is further confused by the software licens implicitly accepted by those of us who buy microcomputer software. Those licenses typically stipulate that it is a violation of the license agreement to use the software on more than one machine, even if those machines are personally owned by the buyer and used by no one is somewhat akin to the idea of a book publisher attempting to license a book to be read only in the front bathroom and not in the back bathroom.

It is apparent that the current copyright laws are not always relevant to computer software. This is because copy right laws come out of a tradition orient ed to printed matter rather than electronic media

For example, it is allowable under the copyright laws for small parts of copyrighted material to be reproduced for educational purposes. This is fine for printed material, but it is difficult to imagine a situation in which one could take and reproduce a small segment of machine language from a compiled computer program that would serve any meaningful purpose, educational or oth-

Clearly an author, or other holder of copyright, should have protection. But we have not yet arrived at a clear-cut answer to what that means in terms

# Windowing seen gaining praise But pundits question its usefulness

By Paul Korzeniowski

One of the hottest buzzwords in the microcomputer industry these days is multiple windowing. This feature allows users to monitor up to seven concurrent func-

tions on a single CRT screen, often giving the user the ability to hop from one application to another and to share data among several related programs. But how useful is the fea-Microcomputer vendors will say cannot live without it. But some industry watchers believe multiple windowing may be a passing fancy.

"Many vendors are designing windowing products, yet its useful-

ness hasn't been proven," noted Janice Antonellis, research manager for software and services at International Data Corp. in Framingham, Mass. "It may be useful for multitasking applications, but I am not sure it has many other practical applica-

In fact, some industry analysts contend windowing packages, like the environment offered with Apple Computer, Inc.'s Macintosh, are no better than integrated applications, which share data without requiring that a user change diskettes. The advantage is the integrated applications are all visible on one screen, requiring the user to press a function key to move from

spreadsheet to processing functions.

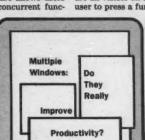
Other windowing software, such as Digital Research, Inc.'s Concurrent CP/M 3.1 and the package that works with Apple's Lisa system, offer multitasking capabilities. "The user can monitor one application's progress while using a different appli-cation," noted Gary Gysin, director of product marketing and manager of the Operating Systems Division at Digital

"For example, a user could work on a spreadsheet while a data base sort is com-

The number of windows offered by various packages typically runs from four to seven. But how many can the user use at

'Most of our users monitor two or three

See WINDOW page 92



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#### SYSTEMS

#### ELECTRO DESIGN, INC. TMP-12

Electro Design, Inc. has announced the IMP-12, a microcomputer that uses IBM's PC-DOS 2.0 operating system and is compatible with the IBM Personal Computer.

According to the vendor, the 12slot processor can handle up to two half-height drives, either floppy or hard disk

The floppy disk drives are 5¼-in., double-sided, double-density with 500K bytes of unformatted storage, according to the vendor.

The hard disk drives are available with a 13.34M-, 26.70M- or 40M-byte

The IMP-12 CPU is Intel Corp. 8088 based and features a read-only memory resident Basic I/O that offers Microsoft, Inc.'s MS-DOS calling conventions, plus extensions for scientific and industrial applications, the vendor said.

The list price of the IMP-12 starts at \$3,428.

Electro Design, 690 Rancheros Drive, San Marcos, Calif. 92069.

#### ET COMPUTER SYSTEMS ET-2010

ET Computer Systems has introduced ET-2010, a microcomputer that uses a Zilog, Inc. Z80 micro-

The computer features 64K bytes of random-access memory (expandable to 1M byte), a 9-in. monitor, a

parallel port and a serial port, ac-

cording to the vendor.

The system uses ETPM II, an enhanced version of Digital Research, Inc.'s CP/M Release 2.2 operating system. Word processing, spread-sheet, general ledger, accounts re-ceivable, accounts payable and payroll with job costing applications bundled with the system, the vendor

The system costs \$1,349. ET Computer Systems, roadway, Lemon Grove, Broadway, Calif

#### ALSPA COMPUTER, INC. MC-4010; MC-4020; MC-4035; MC-4050

Alspa Computer, Inc. announced four desktop microcomputers that can be tied into the firm's Alspa-Net

The desktop units feature a Zilog, Inc. 280A microprocessor, 64K bytes of random-access memory, two RS-232 serial ports, two parallel ports and an RS-422 network interface. Bundled software includes a propri-

tary operating system and an electronic mail package, the vendor said. The MC-4010, with a 10M-byte hard disk drive, costs \$4,495; MC-4020, with a 20M-byte hard disk drive, sells for \$5,495; MC-4035, with a 35M-byte hard disk drive, costs \$6,495; and MC-4050, with a 50Mbyte hard disk drive, costs \$7,495.

Alspa Computer, 477 Division St., Campbell, Calif. 95008.

#### APPLICATION INNOVATIONS Point-of-sale system

Application Innovations an-nounced a turnkey point-of-sale sys-tem based on the IBM PCjr.

The system features a 9-in. mono-chrome display, 128K bytes of random-access memory, a 40-col. print-er, 370K bytes of disk drive, point-of-sale software and a cash drawer with change holder, according to the vendor.

A user can change product de-scriptions and prices, the vendor

The system costs \$3,250. Application Innovations, 1550 Old W. Henderson Road, Columbus,

#### MORROW, INC. MD11 price increase

Morrow, Inc. has raised the retail price of its MD11 hard disk desktop microcomputer system from \$2,745 to \$2,995 because of what the firm said are unexpectedly high manufacturing costs.

Manufacturing costs, particularly those associated with outside ven-dors, have been higher than anticipated," a spokesman said.

The MD11 is an 8-bit personal/ business computer system based on Digital Research, Inc.'s CP/M operating system. Shipments began in November.

Morrow, 600 McCormick St., San Leandro, Calif. 94577.

#### PRINTERS/PLOTTERS/ PERIPHERALS

#### FUTURENET CORP.

Futurenet Corp. has announced a en plotter interface that allows engineers to plot schematics generated on Futurenet's IBM Personal Computer-based Dash-1 schematic designer on the Hewlett-Packard Co. HP 7580, 7585 and 7470 plotters.

According to the vendor, the inter-face was designed for producing schematics that require hard-copy output in sizes ranging from 81/2 by 11 in. to 34 by 44 in.

There is a choice of roller-ball, fi-ber-tip or liquid drafting pens of var-ious colors and widths, the vendor

The package includes the Bausch & Lomb DMP-41 plotter with pedestal and the Dash-1 driver software, according to the vendor.

Available now, the D1-Plot/HP is priced at \$600.

Futurenet, 21018 Osborne St., Canoga Park, Calif. 91304.

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Publisher's Price: \$19.95.

#### 2. BASIC AND THE PERSONAL COMPUTER.

By Thomas A. Dwyer and Margot Critchfield. Learn to program in BASIC within eight hours. Includes: computer graphics, program development, data bases, and more. Also, many step-bystep examples of word processing, com-puter games, and computer simulations. Publisher's Price: \$15.55.

#### 3. CP/M AND THE PERSONAL COMPUTER.

By Thomas A. Dwyer and Margor Critchfield. Down-to-earth explanations break CP/M into basic components for easy mastery of filling, debugging, editing, information flow, and more, Includes

coverage of how to use popular com-mercial CP/M application programs. Publisher's Price: \$19.95.

#### 4. THE LITTLE BOOK OF BASIC STYLE: How

to Write a Program You Can Read.

By John Nevison. Challenges the reader to go beyond computer literacy to fluency, teaches how to write pro-grams of less than one page, and encourages thoughtful program organization. Covers everything from algorithms to games. Publisher's Price: \$8.25.

#### 5. DATA FILE PROGRAMMING IN BASIC: A

5. DATA FILE PROGRAMMING IN BASIC: A Self-Teaching Guide.

By LeRoy Finkel and Jerald R: Brown. For both hobby ists and professionals who want to add data file programming to their computing capabilities. Includes: self-teaching data files and fit in a wirt. maintaining data files, modifying exist-

#### ing programs, and writing your own. Publisher's Price: \$12.95.

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In response to the increasingly heavy involvement of DP/MIS people in computer-aided manufacturing (CAM) and computer-aided engineering (CAE), Computerworld is preparing a Special Report that focuses on CAM/CAE, manufacturing resources planning (MRP), robotics, inventory and shop floor control.

We'll also cover the effect these new technologies are having on traditional manufacturing operations. And on the delicate relationships between traditional DP departments and the factory automation specialists.

If you act before March 9th — your products or services can be represented. To reserve space in this issue, call one of the sales offices listed below or call Ed Marecki, National Sales Director at (617) 879-0700.

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#### BOARD-LEVEL DEVICES

#### DY-4 SYSTEMS, INC. DSTD-187 card

Dy-4 Systems, Inc. has introduced the addition of the DSTD-187 processor card to its line of STD bus products.

The DSTD-187 is an Intel Corp. 8088-based product incorporating the Intel 80130 RMX processor, two RS-232C serial channels and optional Intel 8087 math coprocessor, according to the vendor.

Both Zilog, Inc. Z80 and Intel 8088 bus architectures are supported. According to the vendor, 1M-byte memory addressing is supported.

The product costs \$584.

DY-4 Systems, Suite 202,
1475 S. Bascom Ave., Campbell, Calif. 95008.

#### METRABYTE CORP. Model PI0-12

Metrabyte Corp. has announced a parallel, digital I/O interface board, Model Pi0-12, that plugs into the IBM Personal Computer XT.

According to the vendor, the PI0-12 provides 24 transistor-to-transistor and diode-to-transistor logic-compatible lines.

Other features include an interrupt input and external connections to the microcomputer's bus power, the vendor said.

The price is \$89 in single quantities.

Metrabyte, 254 Tosca Drive, Stoughton, Mass. 02072

#### NUMBER NINE COMPUTER CORP. Revolution graphics board

Number Nine Computer Corp. introduced its Revolution graphics board for the IBM Personal Computer.

The board uses a NEC Information Systems, Inc. 7220 16-bit graphics coprocessor, the vendor said.

A display can use two modes: pixel and plane. With pixel mode, the user can modify a single pixel across 8-bit planes of random-access memory in one read or write operation, according to the vendor.

In plane mode, the user can modify eight pixels in a 1-bit plane, the vendor said.

The board costs \$945.

Number Nine Computer,
691 Concord Ave., Cambridge, Mass. 02138.

#### HELIONETICS, INC. APB-3000PC series

Helionetics, Inc. has announced a series of singleboard array processors that is said to increase the computational speed of an IBM Per-

sonal Computer or look-alike.
The APB-3000PC series reportedly enables the Personal Computer to perform mathematical calculations up

to 10,000 times faster than a Personal Computer not equipped with the device, according to the vendor.

It runs Fortran or Basic under IBM's PC-DOS operating system and is programmable. A high-level assembler and monitor package is also available for custom microcode development, the vendor said.

Prices start at about \$2,000 for a 16-bit math integer APB-3000PC board and \$4,250 for a 16-bit integer or 24-bit full floating-point board, a spokesman said.

Helionetics, 17312 Eastman St., Irvine, Calif. 92714.

# AUXILIARY

DATA DECISIONS Microcomputer service

Data Decisions has an-

nounced an information service for microcomputer hardware and software that reportedly was designed for corporate or institutional buyers of multiple systems.

Called Microcomputers, a key feature of the service involves the testing of major software products by the vendor's laboratory staff.

Areas covered by the service include microcomputers, software, expansion/extension cards, communications

and peripherals, accessories and support equipment, according to the vendor.

A one-year subscription to the service includes two loose-leaf volumes updated monthly, 12 supplements, 12 newsletters and unlimited free telephone consulting. Charter subscriptions are available for a limited time for \$625.

Data Decisions, 20 Brace Road, Cherry Hill, N.J.



# We're back

#### MICROPRO INTERNATIONAL CORP. Startutor series

Micropro International Corp. has introduced a line of training tools, the Startutor

The on-disk interactive computer-aided instruction (CAI) tutorials include lessons for the firm's Wordstar (word processing) and Info-star (data base management system).

Videotape instruction is available for Wordstar and will soon be available for Infostar, Calcstar (the firm's electronic spreadsheet) and Starburst (the firm's pro-gram that reportedly links the other products). The self-paced tape provides the trainee with interactive trainee with interactive training, reinforced with graphics and animation.

Users who have Wordstar Version 3.3 for IBM's PC-DOS operating system can purchase the Wordstar Quick Lesson CAI for a handling charge of \$5 each until Feb. 29. The extended lessons feature seven sessions, each approximately 30 minutes long. Each extended lesson CAI product is priced at \$79.95.
Micropro's Wordstar Vid-

eo Training Tape, in 1/4-in. VHS and 1/4-in. Betamax for-mats, will be available in the spring for a suggested retail price of \$99.95. The %-in. U-Matic format will be priced at

Your processing may be remote, but

\$129.95, the vendor said.

Micropro International, 33 San Pablo Ave., San Rafael, Calif. 94903.

ADVANCED DATA SUPPORT SYSTEMS, INC. Advanced Data Analyzes

Advanced Data Support Systems, Inc. has announced Advanced Data Analyzer, a hardware and software enhancement that monitors RS-232 asynchronous data communications

The product taps into any line between two devices. It displays and stores data transmissions and allows the user to examine data, the vendor said. The data analyzer transmits user-defined character strings and can perform a byte/bit error rate test, according to the vendor. The product costs \$1,695.

Advanced Data Support Systems, Suite 1, 217 Mt. Vernon Ave., Bakersfield, Calif. 0.9307

#### **MICRO SOFTWARE**

#### COMMODITY TRADING SYSTEMS

Commodity Trading Systems has announced the Cats computer-aided trading package for the IBM Personal Computer.

A vendor spokesman said Cats was designed as a tool with which commodity traders can collect real-time market data, analyze price and volume and generate a trade signal based on that information and the trader's financial position and objectives.

The spokesman said that, in addition to historical price and volume analysis, Cats also features a "what-if" simulator to determine the optimum trading parameters for each contract, an updated quote page, data base query and report generation and

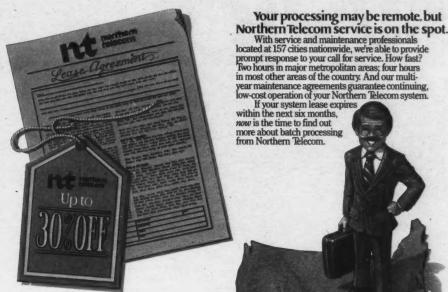
gross profit summary.
Cats is leased for \$40,000/ year, which does not include hardware.

Commodity Trading Systems, Suite 107, 11301 Richmond, Houston, Texas 77082.

#### HUMANIC DESIGN CORP. MSP

Humanic Design Corp. (HDC) has introduced a human resource management package for the IBM Personal Computer XT. The Microcomputer Personnel System (MPS) was designed for organizations with 200 to 2,000 employees.

MPS reportedly supports all major human resource management functions, stores payroll information and can be linked directly to in-house or payroll services. In addition, MPS can provide complete word processing, Continued on page 77



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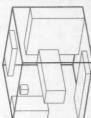
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A free-standing, menu-driven sys-tem with communications options, MPS requires a Personal Computer AT configuration of a 10M-byte fixed disk, plus 360K-byte capacity dis-kette drives and 256K bytes of memo-

MPS software is priced at \$18,000 with optional rental and/or lease. HDC, 207 Summit Ave., Mahwah,

N.J. 07430.

#### APPLIED SOFTWARE TECHNOLOGY, INC. Versaform Release 2.7

Applied Software Technology, Inc. has announced the Versaform Re-lease 2.7 for Texas Instruments,

Release 2.7, which runs under Microsoft, Inc.'s MS-DOS operating system, is also available for the IBM Per-

sonal Computer. Data entered into the system creates a data base of form records. Data from the data base may be selected, sorted and written to an MS-DOS file for use by word processors, spread-sheets and other programs, the ven-

The suggested retail price of Ver-saform Release 2.7 is \$389. Applied Software Technology, 170

ples Drive, Los Gatos, Calif.

#### RADIO SHACK Cobol instruction

Radio Shack has announced an educational software package designed to teach secondary and college students and adults the fundamentals of programming Cobol.

The package contains a comprehensive manual and a diskette with exercises that can be used with any Radio Shack TRS-80 Model II, 12 or 16 disk system with at least 64K

bytes of memory.

Volume One is available for \$49.95. Class notes are priced at \$9.95 and are sold as an aid to instructors for use in the classroom.

Radio Shack, 1800 One Tandy
Center, Fort Worth, Texas 76102.

## SIGNIIM MICROSYSTEMS, INC.

Signum Microsystems, Inc. has introduced Documax, an information management package for the Apple Computer, Inc. Apple II microcom-

Documax is a document-handling package that features word process ing, electronic mail and other text files, the vendor said.

Documax runs on the Apple II, II+ or Ile with 48K bytes of memory. It also runs on the Apple III in Apple II emulation mode.

The product sells for \$175. Signum Microsystems, 120 Mountain Ave., Bloomfield, Conn. 06002.

# IDEAWARE, INC.

Ideaware. Inc. has introduced the Idea Processor, a software package for IBM Personal Computer users.

The Idea Processor combines a card-file-style, free-form file manager with word processing software and can incorporate graphics stored as file cards, the vendor said.

Minimum system requirements are

an IBM Personal Computer or compatible machine with 192K bytes of memory. A printer is optional, the vendor said

The Idea Processor sells for \$295. Ideaware, 225 Lafayette St., New York, N.Y. 10012.

#### ZOOM TELEPHONICS, INC.

Zoom Telephonics, Inc. has introduced Netmaster, a communications program for Apple Computer, Inc.'s

According to the vendor, Netmas-ter can be used with 300 bit/sec mo-dems. The package will receive and transmit any file developed under Release 3.3 of Apple's DOS operating system, the vendor said.

Netmaster is priced at \$79. It is

sold with Zoom's Networker modem (including a free membership to The Source data base) for \$179, the ven-

Zoom Telephonics, 207 South St., Boston, Mass. 02110.

#### DATAMENSION CORP.

Datamension Corp. has introduced feature for its Report Manager three-dimensional software, a com-mand language called Exec. The package runs on IBM's Personal Com-

Exec is a language that uses Basiclike commands or can capture and re-peat sequences of keystrokes, the

Minimum system requirements are 128K bytes of random-access memo-

ry and two disk drives

The suggested list price of Report Manager is \$399.

615 Drive, Northbrook, Ill. 60062.

#### STONEWARE, INC.

Stoneware, Inc. has enhanced DB Master to include a file converter.

DB Master's file converter reads files created with Software Publishing Corp.'s PFS:File and Visicorp's Visifile programs into DB Master. It can use alphanumeric, numeric or data fields, the vendor said.

The data base costs \$350 and runs on Apple Computer, Inc.'s Apple IIe. nvare, 50 Belvedere St., San Rafael, Calif. 94901.

See MICRO page 78

# VIEWCOM

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City Operating System Release

#### MICRO from page 77

SOFTWARE SYSTEMS, INC.

Personal Computer Print Utility

Software Systems, Inc. (SSI) has announced a package that allows a report from an IBM System/34 or System/36 minicomputer to be printed on an IBM Personal Computer.

According to the vendor, the Personal Computer Print Utility converts spooledprint files on the host system to Personal Computer-formatted text files.

The utility was designed for users of SSI's 5251 Model 12 emulation and file-transfer utility to allow off-line storage and printing of spooled reports.

The product is available at a price of \$75 for the System/
34 and \$90 for the System/
36, including report program generator source code.

Software Systems, P.O. Box 1766, Jefferson City, Mo. 65102

#### PROFESSIONAL MICROSYSTEMS, INC. Bizplan

Professional Microsystems, Inc. has introduced Bizplan, a software template that enables users to create a business plan and analyze alternative sales strategies under changing conditions.

According to the vendor, Bizplan can run on any system running Digital Research, Inc.'s CP/M operating system. Systems must have a minimum of 48K bytes of random-access memory.

random-access memory.

The suggested retail price of Bizplan is \$195.

Professional Microsystems, Richardson Plaza, Rt. 309 & Richardson Road, Montgomeryville, Pa. 18936.

#### LIBRA LABORATORIES, INC.

#### **Gantt-Pack Version 3**

Libra Laboratories, Inc. has announced Gantt-Pack Version 3, a menu-driven project management software package for Radio Shack TRS-80 Models I/III and I/12 microcomputers.

According to the vendor, the product is a project control and resource management tool that enables users to store data on each project's requirements. Ganti-Pack can be used to automate drawings, create charts and sort data.

Gantt-Pack costs \$395. Gantt Systems, Libra Laboratories, 495 Main St., Metuchen, N.J. 08840.

#### GENASYS CORP. Telios Versian 2.0

Genasys Corp. has announced the release of Version 2.0 of its asynchronous communications package, Te-

lios, for the IBM Personal Computer, Personal Computer XT and Personal Computer-compatible computers.

Telios operates at speeds ranging from 110 to 9,600 bit/sec through any smart, acoustic or dataphone-type modem hard wired to a machine or via a network. Its internal buffering is said to allow screen scrolling of at least 250 lines of data during communications. Any additional memory can also be

used as a screen buffer, allowing scrolling of more than 250 lines.

Telios costs \$119.95, including documentation.

Genasys, Microcomputer Products Group, 11820 Parklawn Drive, Rockville, Md.

#### ADDISON-WESLEY PUBLISHING CO. Micro-DSS/Finance

Prices of Micro-DSS/Fi-

nance (DSS/F), a microcomputer financial modeling software package from Addison-Wesley Publishing Co., have been reduced by 33%.

DSS/F is an integrated package that combines financial modeling, graphics and reporting. It can be purchased through dealers or Addison-Wesley at the new prices of \$795 for Apple Computer, Inc. versions and \$995 for the IBM Personal Computer version, a spokes-

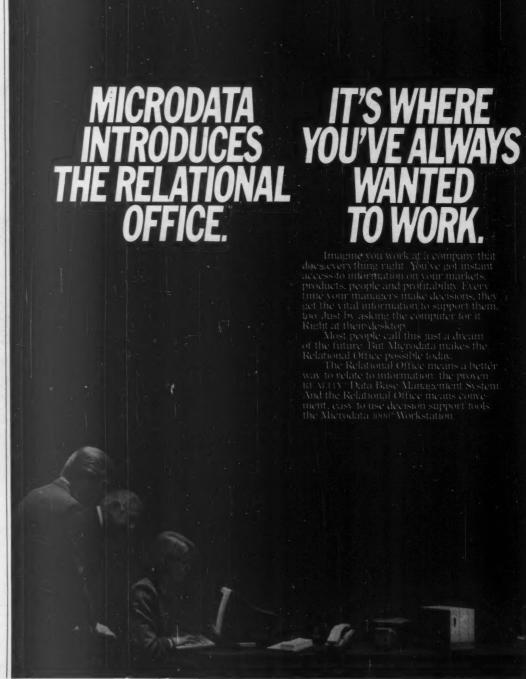
man said.

Addison-Wesley, Reading, Mass. 01867.

#### HUMAN SYSTEMS DYNAMICS PC Statistician

Human Systems Dynamics has introduced a general statistics package for the IBM Personal Computer. According to the vendor,

According to the vendor, PC Statistician provides a research data base. The prod-



uct also offers the graphics options of data set plots, bar graphs, scatter plots and curve fittings, the vendor said.

System requirements are an IBM Personal Computer with 128K bytes of memory, two double-sided, double-density disk drives and Release 2.0 of IBM's PC-DOS. A printer is optional.

The price of the package is

Human Systems Dynam-

ics, Suite 222, 9010 Reseda Blvd., Northridge, Calif. 91324.

#### I.P. SHARP ASSOCIATES, LTD. APL/PC

I.P. Sharp Associates, Ltd. has introduced an implementation of the APL development language for the IBM Personal Computer.

Called APL/PC, the pack-

is compatible age

Sharp's mainframe software products. This is accom-plished by basing the micro-computer product on a Sys-

tem/370 emulator.

Therefore, all APL constructs available in a mainframe environment are also available in the microcomputer environment. These include all primitive functions and operators and all data types, including packages and enclosed arrays, the vendor said.

The system runs as a user program under the IBM Per-sonal Computer operating system PC-DOS Version 1.1 or 2.0. The package includes the interpreter, the file system, the session manager, several auxiliary processors and the utility software.

The price of APL/PC is

I.P. Sharp Associates, Suite 1900, 2 First Canadian Place, Toronto, Ontario, Canada M5X1E3.

#### STRATEGIC SOFTWARE SYSTEMS, INC. Bottomline V

Strategic Software Systems, Inc. has introduced Bottomline V, a financial modeling, planning and fore-

The product operates with spreadsheet programs, such as Lotus Development Corp.'s 1-2-3 and Visicorp's Visicale. Visicalc. The package runs on the IBM Personal Computer XT, the Xerox Corp. 820, Digital Equipment Corp.'s Rainbow and Apple Computer, Inc.'s processors. The package also runs on Micro-The soft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M operating systems.

The suggested retail price is \$295.

Strategic Software Sys-tems, Suite 200, 1300 Dove St., Newport Beach, Calif. 92660.

#### ZYLAB CORP. Zyindex

Zylab Corp. has intro-duced Zyindex, an information search and retrieval package that finds information in any Ascii-based text files. The package runs on the IBM Personal Computer, Personal Computer XT and

compatible systems.

According to the vendor, Zyindex stores information from documents created with a word processing package or obtained from other public data bases. Users retrieve information from their files by entering search requests on

any topic. Zyindex requires 92K bytes of memory and two disk drives.

The list price of the product is \$295.

Zylab, 233 E. Erie, Chicago, Ill. 60611.

#### PERSORT, INC. Smarterm 100

Persoft, Inc. has an-nounced Smarterm 100, a terminal emulation/file transfer package for the IBM Personal Computer and compatible

The product is said to allow the Personal Computer to function as a Digital Equipment Corp. VT100, VT101, VT102 or VT52 CRT terminal and to transfer Ascii or binary files between the Personal Computer and a host computer system.

Smarterm 100 runs un any version of IBM's PC-DOS operating system and can be installed on hard disk, the vendor said.

It requires 128K bytes of emory, one double-sided memory, one double-sided diskette drive, an asynchro-nous adapter and either the monochrome display or an 80-col. color monitor, according to the vendor.

It is priced at \$149. Persoft, 2740 Ski Lane, Madison, Wis. 53713. Continued on page 80

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# Microdata



#### MICRO from page 79

#### DATA CONSULTING GROUP PC File: PC Screens and Men

Data Consulting Group has announced two utility products for the IBM Personal Computer running Microsoft, Inc.'s MS-DOS and compatible operating systems.

PC File Utilities is a series of programs designed to facilitate file management. According to the company, the programs allow the user to print, display or edit random files by entering the file name; print or display se quential files; and display data si-multaneously in four formats: character, Ascii, hex and bit flag.

PC Screens and Menus is a menu and screen generator that creates Basic screens for data entry. Once the screen is drawn, it can be saved in a file and accessed by any program.

The utilities cost \$50 each, require

less than 64K bytes of memory, a monitor and one or two single- or double-sided diskettes.

Data Consulting Group, 12 Sk lark Drive, Larkspur, Calif. 94939.

#### MYCROFT LABS, INC. Mite/MS

Mycroft Labs, Inc. announced Mite/MS, a menu-driven communications program that runs under Microsoft, Inc.'s MS-DOS operating system.

Mite/MS features user-selectable options to capture text from or send to any asynchronous, Ascii, on-line system, according to the vendor. A

user can define 10 programmable macro strings which can be invoked by a function key, the vendor said. Mite/MS costs \$195.

Mycroft Labs, Suite B188, 2639 N. Monroe St., Box 68, Tallahassee, Fla.

#### PHASER SYSTEMS, INC.

Phaser Systems, Inc. announced Virtual Diskette Access Method (Vdam), a software tool that allows IBM Personal Computers to access and store IBM mainframe data.

With Vdam, the mainframe appears as an infinite set of diskettes to any program running on the Personal Computer, according to the vendor. The user stores and accesses mainframe data in a format identical to that on the Personal Computer.

The system operates under IBM's

The package costs \$600 for main-frame software and \$300 for each Personal Computer attached to the mainframe

Phaser Systems, 24 California St., San Francisco, Calif. 94111.

#### DATA MANAGEMENT ASSOCIATES, INC. Magic

Data Management Associates, Inc. has introduced Machine Generated Integrated Code (Magic), a programming language which the company claims increases programmer productivity tenfold. The package runs on microcomputers using Digital Research; Inc.'s CP/M operating sys-

The language features internal data areas with variable buffers and dynamic allocation, screen formatting and editing, the ability to mix as sembler language anywhere in Magic source code, string manipulation capability and control-conditional com pilation of source code, according to

Magic for CP/M costs \$795. It costs \$995 for microcomputers using CP/M 86 or MS-DOS, an operating system from Microsoft, Inc.

Data Management Associates, P.O. Box 4340, Wilmington, Del. 19807.

#### INFORMATION BUILDERS, INC. Focus for IBM XT/270

Information Builders, Inc. has announced the availability of its Focus nonprocedural data base and information management package for the IBM Personal Computer XT/370.

Focus, operating under the IBM VM/CMS environment, reportedly combines a relational data base and screen management facilities with an English nonprocedural language for queries, formal reporting, graphics, statistical analysis and financial

modeling.
Information Builders reports that rs of the desktop XT/370 using IBM's VM operating system on main-frames can access their information centers with Focus. The users reportedly can use English commands to analyze files on their CMS minidisks.

Focus on the XT/370 is licensed as a rider to a user's existing mainframe license. The purchase price for one to eight XT/370 machines is \$8,400, and the lease price is \$375 per month Information Builders, 1256 Broadway, New York, N.Y. 10001. 1250

#### COLLINS & ASSOCIATES, INC. Cpert; File-It; Plot-It; LC Data

Collins & Associates, Inc. has introduced four business programs: Cpert, File-It, Plot-It and LC Data.

According to the vendor, all the programs were designed to run on ei-ther the Hewlett-Packard Co. HP 86 or HP 87 microcomputers, with memory requirements ranging from 64K bytes to 160K bytes, depending on the program.

Cpert was designed for managers to use in planning a project. It enables the user to focus attention on the plan, measure progress and take corrective action. It requires 160K bytes of memory, according to a spokesman for the vendor. File-It is a data file management

package with a capacity of 65K bytes of memory, according to the vendor spokesman. Records can be sorted on any field for the whole file or select-ed parts of the file. In displaying or printing records, the fields can be arranged in any order, and the display can be vertical or horizontal. It requires 128K bytes of memory, the spokesman said.

Plot-It is a program for plotting angle or multiple line curves and performing linear regression curve fits of curve data. The program is menudriven. Manipulation of data can be performed, and statistical analysis

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can be done to give the mean, variance and coefficient of variation. It

requires 96K bytes of memory.

LC Data is a learning curve program that provides a tool for production, marketing and general manage-ment users to make decisions on manpower, prices and materials. The program can calculate production costs or hours and then forecast future unit- and lot-production hours and costs. It requires 64K bytes of

Programs are supplied on 5¼-in. floppy disks. Prices are \$175 for Cpert, \$100 for Flle-It, \$150 for Plot-It and \$95 for LC Data.

Collins & Associates, 187 Flying Mist Isle, Foster City, Calif. 94404.

#### BUSINESS SOLUTIONS, INC. Jack2

Business Solutions, Inc. has introduced Jack2 for the Apple Computer, Inc. Apple IIe. The Jack2 is an integrated software package that does word processing, spreadsheet analy-sis, charting and data base management tasks on the same screen without windows.

According to the vendor, Jack2 was originally designed for the IBM Personal Computer.

Jack2 features commands displayed on a two-line area at the top of the screen, handles multiple col-umns of text on the same page and can hide confidential information in the middle of the text.

All screen information, including the spreadsheet and the bar chart, is printed out on a single page the same way it appears on the screen, the vendor said.

Jack2 is priced at \$395, according

to the vendor.

Business Solutions, 60 E. Main St.,
Kings Park, N.Y. 11754.

#### STAR ENTERPRISES, INC.

Star Enterprises, Inc. has introduced Stardriver-I, a package that enables the Hewlett-Packard Co. HP 9000 Model 20 microcomputer to supsic. port multiple users in Ba

According to the vendor, multiple users may interact via remote terminals for graphics as well as program

development and execution.

The software is priced at \$1,045, the vendor said.

Star Enterprises, 310 Crestwood Drive, Selma, Ala. 36701.

## SOFTLOGIC SOLUTIONS

Softlogic Solutions has introduced Doubledos, an operating system en-hancer that lets the IBM Personal Computer and Personal Computer XT microcomputers perform two simultaneous functions. It does not require any software modification.

According to the vendor, Doubledos acts as an extension to the canabilities of IBM's PC-DOS, either Release 1.1 or 2.0.

Doubledos can run on systems

with as little as 128K bytes of memory, depending on the application, though 192K bytes of memory are recommended by the vendor. Th no need for the user to buy additional hardware, terminals or cables, the vendor claimed.

According to the vendor, Double-dos works by dividing a system's memory into two areas, one for each program running. The memory can be

divided in any way the user chooses. The price of Doubledos is \$299, the vendor said.

Softlogic Solutions, 530 Chestnut St., Manchester, N.H. 03101.

#### OPUS CORP. Workstation Emulator

Opus Corp. has introduced the Workstation Emulator, which allows an IBM Personal Computer or Personal Computer XT to act as a Hewlett-Packard Co. HP 250 workstation.

According to the vendor, HP 250 software features such as screen-la-beled soft keys, forms and video enincements are emulated. Several additional features extend the emula-tor's applicability, including an As-cii-Ansi mode for autodial modem control, data logging to disk files and

local printer support.

The product costs \$500, according

to the vendor.

Opus, 20251 Century Blvd., Germantown, Md. 20874.

## BAILEY & ROSE LTD.

Bailey & Rose Ltd. has added a prototyping tool for the IBM Personal Computer to its Act/1 family of productivity software.

Called Compact, the product was designed to facilitate the development of prototypes and allow the user to test design concepts and specifications, as well as demon-strate working models. It includes screen development functions and logic plan facilities.

Compact requires an IBM Personal

Computer or compatible system with 256K bytes of memory, two double-sided, double-density diskettes or one hard disk, IBM's PC-DOS operating system, Release 1.1 or 2.0 and a color graphics board or monochrome adapter. It costs \$1,500.

Bailey & Rose, 620-1033 Davie St., Vancouver, B.C., Canada V5E 1M7.

#### NEW MEDIA GRAPHICS CORP. Graphover listing

New Media Graphics Corp. has of-fered a free listing of specific fea-tures its Graphover 9500 software driver that runs under IBM's PC-DOS operating system.

The graphics driver allows color graphics to be controlled by the IBM ersonal Computer, and the graphics

ed on page 84



#### From the cutting edge of NCR software engineering comes NCR/SNA Systems Network Architecture

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\*UNIX is a trademark of Bell Telephone Laboratories, Inc.



#### sed from page 81

can be overlaid on video coming from videodisk, videotape or TV cameras. The combined pictures can be displayed on any monitor or recorded on videotape, the vendor said.

New Media Graphics, 279 Cambridge St., Burlington, Mass. 01803.

#### VIKING ASSOCIATES Firefile; Nativelinx

Viking Associates has introduced Firefile and Nativelinx communications packages for users of Apple Computer, Inc. Apple II+ and IIe mi-

Firefile allows the user to transfer files between micros at speeds up to 38,400 bit/sec, or approximately 90 page/min, the vendor said.
The Nativelinx 3270 system pro-

vides an emulation of a remote IBM 3270 display terminal system with the Apple II+ or IIe. The package op-erates at line speeds of 1,200 to 9,600 bit/sec in a half-duplex mode over full-duplex facilities, the

The Firefile package is priced at \$250. The Nativelinx package is priced at \$845.

Viking Associates, P.O. Box 263, Colorado Springs, Colo. 80901.

# ADDISON-WESLEY PUBLISHING

Addison-Wesley Publishing Co. recently announced an analytical soft ware package for the IBM Personal Computer that is said to bring decision support analysis to managers

reportedly Micro-DSS/Analysis provides statistics, report writing, graphics, data base management facilities and the ability to perform ad hoc analysis.

The package costs \$495.
Addison-Wesley Publishing, Reading, Mass. 01867.

#### DUNBAR-RIDGE CORP. Filedriver

Dunbar-Ridge Corp. has introduced Filedriver, an integrated set of utilities for Digital Research, Inc.'s CP/M or MP/M and Musys Corp.'s Turbodos operating systems.

Filedriver operates on any file and accesses files independently of user area or attribute-flag status, according to the vendor. Utilities can be ac-

cessed in five ways: file selection, file processing, user interaction, file protection and on-line display.

Filedriver costs \$85.

Dunbar-Ridge, 102 Sterling Court, Syosset, N.Y. 11791.

## AMERICAN PLANNING CORP.

American Planning Corp. announced Megabasic, a programming language that reportedly can address byte of random-access memory.

Megabasic features an execution speed reportedly six times faster than Mbasic from Microsoft, Inc. Other features include variable names, which can be 255 characters long, and a trace-and-edit capability, ac-

cording to the vendor.

Megabasic runs under MS-DOS from Microsoft and the CP/M 86 operating system from Digital Research, Inc. The programming language costs \$400.

American Planning, Suite 423, 4640 Duke St., Alexandria, Va.

#### DCD CO. Job Shop Control version

DCD Co. announced an IBM Personal Computer XT-compatible ver-sion of its Job Shop Control package. The package includes job costing,

payroll, accounts payable, accounts receivable and general ledger appli-cations, the vendor said. The job costing module features job status re-ports, daily production figures, monthly statistics, efficiency figures, job costs and due dates for jobs.

The job-costing application costs \$2,900; the other four packages cost \$900 each. Together, the five applications cost \$6,000.

DCD, 1601 W. River Road N., Minneapolis, Minn. 55411.

#### BELLESOFT, INC. **Entry System for Programs**

Bellesoft, Inc. has introduced a language-oriented editor for computer-aided programming on IBM's Personal Computer using the Pascal and Clanguages.

Entry System for Programs is said to check programs for syntax errors and automatically format code for readability, saving compiling and de-

bugging time. ES/P is priced at \$249 for Pascal on a single-machine license and \$349 for Pascal and C.

Bellesoft, Suite 150, 2820 Northup Way, Bellevue, Wash. 98004.

## REMROL COMPUTER SERVICES,

#### Screen.cob Version 2.0

Remrol Computer Services, Inc. has announced Version 2.0 of its Screen.cob Cobol screen code generator for use with Microsoft, Inc.'s IBM Personal Computer Cobol package.
According to the vendor, Screen.-

cob is a utility program that writes Cobol code for screen set-up in a stan-dard Ascii file text editor.

Screen.cob can also overlay multiple screens and set up a series of screens at one time. The package reportedly will operate on any micro-computer that can run Microsoft's IBM Personal Computer Cobol pack-Version 2.0 of Screen.cob is priced at \$49.95.

Remrol Computer Services, 215 Brighton Ave., Boston, Mass. 02134.

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#### STOK SOFTWARE, INC.

Stok Software, Inc. has announced enhancements to Backrest, its hard disk backup program.

According to the vendor, Backrest runs on Musys Corp.'s Turbodos, Mi-crosoft, Inc.'s MS-DOS, IBM's PC-DOS and a variety of local-area networks.

Enhancements include the ability to select predefined backup routines password-protected file backup and restore, repeated backup to the same hard or floppy disk, improved error handling, optional use of screen color attributes and a German language version with European date format.

Backrest is also available for Digital Research, Inc.'s CP/M, MP/M, CP/ Net, CP/M 86, MP/M 86 and concurrent CP/M at a retail price of \$180. Stok Software, 17 W. 17th St., New York, N.Y. 10011.

#### LOGICAL SYSTEMS, INC.

Logical Systems, Inc. has intro-duced LS/Host/Term, a host-terminal package developed for use with the Radio Shack TRS/DOS operating system on the TRS-80 Model 4 microcom-

The package includes a host system that works in conjunction with the terminal portion of the package. The terminal is designed to emulate an Applied Digital Data Systems, Inc. Adds-5 terminal.

LS/Host/Term is available for

Logical Systems, P.O. Box 23956, 8970 N. 55th St., Milwaukee, Wis.

#### COMPUTER TECHNOLOGY GROUP Unix courses price changes

Computer Technology Group has changed the rental rates for its Unix video tape training courses. Three training courses are available: Unix Overview consists of six modules and costs \$2,100, Unix Fundamentals with 15 modules sells for \$5,250 and C Language consists of 16 modules and sells for \$5,600.

For the first month, the rental prices for any module have been low-ered to 20% of purchase price, the vendor said.

In the second month, the rental cost has been lowered to 15% of purchase price. After the second month, rental prices become 10% of the purchase price, according to Computer Technology.
Computer Technology Group, 310

S. Michigan Ave., Chicago, Ill. 60604.

# AGS COMPUTERS, INC.

AGS Computers, Inc. has announced Smart-C, a software development tool for any mainframe, mini or microprocessor that supports a C

According to the vendor, Smart-C is a full screen intelligent editor for constructing C programs. As a structural editor, Smart-C is said to encourage standardization of software layout and style.

The initial version of Smart-C for

the IBM Personal Computer will be available in the second quarter of 1984. Pricing will be between \$400

AGS Computers, 1135 Spruce Drive, Mountainside, N.J. 07092.

#### **ELITE SOFTWARE**

Elite Software has introduced a relational data base manager for the Radio Shack Color Computer

According to the vendor, Elite-File is an all-machine language that allows users to define their own data record structures. It was written by the author of Elite-Calc, Bruce Cook, and uses the same 6809E microprocessor.

The product is compatible with Elite-Calc and Elite-Word.

The program is available on disk

and requires 32K bytes of memory and Disk Basic.

The price is \$74.50, plus shipping

and handling charges.

Elite Software, Box 11224, Pittsburgh, Pa. 15238.

#### MICROSOFT, INC. Word merge facility

Microsoft, Inc. has introduced a form letter (merge) facility for its Word word processing software. According to the vendor, the facil-ity will allow users to produce cus-

tom form letters by merging variable information with a standard letter. It is also possible to merge a primary document with data stored in another document or Ascii file, the vendor

An expanded printer driver format offers the facility to support all standard printers, including most dot matrix and daisywheel units.

Available the first quarter of this year, the product sells for \$25.
Microsoft, 10700 Northup Way,
Bellevue, Wash. 98004.

#### A.B. DICK CO. Supercalc2

A.B. Dick Co. has announced Su-percalc2, a financial spreadsheet software package for use with its Magna III and Magnawriter information processing systems. The systems use Digital Research, Inc.'s CP/M op-

erating system.
According to A.B. Dick, Sorcim Corp.'s Supercalc2 is an enhanced version of Supercalc. New features include a sort facility to rearrange columns and rows, line-item consoli-dation of spreadsheets, enhanced display and print formatting.

Supercalc2 costs \$295. An upgrade to Supercalc2 costs \$125.

A.B. Dick Co., 5700 W. Touhy Ave., Chicago, Ill. 60648.

See MICRO page 86

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#### MICRO from page 85

#### HUNTER & READY, INC. VRTX C Interface Library

Hunter & Ready, Inc. has introduced the Lattice C Compiler for its VRTX Interface Library for IBM's Personal Computer.

The VRTX C Interface Library reportedly enables programmers using the vendor's VRTX/86 real-time operating kernel to use the compiler to write real-time applications code in C language for any Intel Corp. 8086-based system.

The VRTX C Interface Library is available on 5%-in. floppy diskettes with documentation for \$750.

Hunter & Ready, 445 Sherman Ave., Palo Alto, Calif. 94306.

#### OMNI COMPUTER SYSTEMS, INC. Flash-Com

Omni Computer Systems, Inc. has introduced an integrated electronic mail package that operates on the IBM Personal Computer and PCjr, Apple Computer, Inc.'s Apple II, Radio Shack and other microcomputers.

Flash-Com is said to enable users to implement the U.S. Postal Service's electronic computer-originated mail (Ecom) service.

Features include a mailing list management capability. It also features an Ecom accounting and billing analysis capability, menu screens, help messages and a glossary of Ecom

The product can interface with software packages, such as Micropro International Corp.'s Wordstar; Professional Software, Inc.'s Wordplus-PC; Lifetree Software, Inc.'s Volkswriter; Perfect Software, Inc.'s Perfect Writer; Ashton-Tate's Dbase II; and Lotus Development Corp.'s 1-2-3.

The product retails for \$299.
Omni Computer Systems, P.O. Box 162, Chestnut Hill, Mass. 02167.

#### MASTER COMPUTER SYSTEMS, INC. Formix

Master Computer Systems, Inc. has announced a software development tool for the IBM Personal Computer and compatible systems.

According to the vendor, Formix consists of two related components operating under IBM's PC-DOS and Microsoft, Inc.'s MS-DOS operating systems. One is a runtime executive to manage data traffic between the end user and the application program. The other is a set of interactive screen-forms development tools.

Minimum hardware requirements are 64K bytes of main memory and one disk drive.

The product is available now for a single-license price of \$495 for the Basic version. Compiler language interfaces are available for a one-time charge of \$495.

Master Computer Systems, 9531 W. 78th St., Eden Prairie, Minn. 55344.

## MARK OF THE UNICORN, INC. PCir compatibility

Mark of the Unicorn, Inc. recently announced that its entire software product line will now operate on the IBM PCir.

The vendor's products are The

Finalword, a word processing package; PC/Intercomm, a communications program; and Mince, a screen-oriented text editor.

The programs for the PCjr require 128K bytes of memory and one disk drive, according to the vendor.

Prices for the PCjr programs are: The Finalword, \$300; PC/Intercomm, \$99; and Mince, \$175, the vendor

Mark of the Unicorn, 222 Third St., Cambridge, Mass. 02142.

#### DATAMENSION CORP. Exec on Report Manager

Datamension Corp. has announced the addition of a built-in command language to its Report Manager threedimensional spreadsheet package for the IBM Personal Computer. Dubbed Exec, according to a vendor spokesman, the command language uses Basic-like commands and can capture and repeat sequences of keystrokes. Thirteen of Report Manager's built-in features are pre-programmed Exec functions. These front-end applications involve loan payments, future and present value, effective interest, amortization and linear regression, the firm said.

In addition to the Exec functions, the package offers more than 40 pre-programmed functions including logarithms, trigonometric functions, inverse trigonometric functions, exponents, square roots and standard deviation, according to the vendor

The Report Manager package with the Exec command language is priced at \$399 for the IBM Personal Computer with 128K-bytes random-access memory and dual disk drives, the firm said.

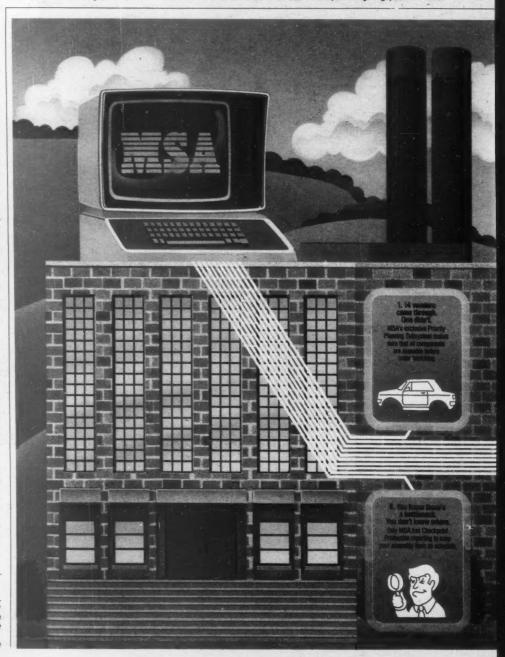
Datamension, 615 Academy Drive, Northbrook, Ill. 60062.

#### ASSOCIATED TECHNOLOGY CO. Software Resources

Associated Technology Co. has introduced Software Resources, an artificial intelligence program for the IBM Personal Computer.

The program allows the user to perform "what-if" analysis to determine the effects of various schedules, staffs, programs, documentation, coding techniques and testing conditions, the vendor said.

The program costs \$30.
Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.



#### MARTIN MARIETTA DATA SYSTEMS, INC.

Martin Marietta Data Systems, Inc. has announced a word processing age for IBM microcomputers.

Writit is a private-label version of Softword Systems, Inc.'s Multimate package, Martin Marietta said.

Writit reportedly provides key-board procedures for insertions, delecursor movement and block manipulation.

The package reportedly allows the user to type Ascii characters into documents for special printer com-mands and features a 90,000-word spelling checker.

Writit costs \$500.

Martin Marietta Data Systems, P.O. Box 2392, Princeton, N.J. 08540.

STRATEGIC SOFTWARE SYSTEMS, INC.

Strategic Software Systems, Inc. has announced a corporate financial planning applications system for a

variety of microcomputers.

Bottomline-V reportedly allows Bottomline-V the user to input basic data variables into a 12-month budget. It then produces five-year pro forma profit and loss, balance sheets, changes in fi-nancial position and financial ratio

The system was designed to run on the IBM Personal Computer and Per-sonal Computer XT, Digital Equipment Corp.'s Rainbow and Kaypro Corp., Apple Computer, Inc. and other microcomputers using Microsoft, Inc.'s MS-DOS and Digital Research,

MSA introduces the only

manufacturing system that tackles

your toughest productionblocks

Inc.'s CP/M operating systems.

The suggested retail price is \$295. Strategic Software Systems, Suite 200, 1300 Dove St., Newport Beach, Calif. 92660.

HEWLETT-PACKARD CO. PFS library; Personal Busine

Hewlett-Packard Co. has announced that the Personal Filing System (PFS) software library from Software Publishing Corp. and HP's Personal Business Calculator pack-age will be added to the software li-brary for the HP 150 touchscreen microcomputer.

The PFS software family includes PFS:File, PFS:Report, PFS:Write and PFS:Graph. PFS:File and PFS:Report will be available for the HP 150 in the

quarter of 1984, PFS:Write and PFS:Graph will be available in the second quarter.

The Personal Business Calculator is said to provide the functions of an HP-12C calculator on the HP 150. Users can touch the numbers and func tions on a screen that resembles the HP-12C to make calculations. The PFS library for the HP 150 is priced at \$265. The Personal Business Cal-culator package is priced at \$75 and is available immediately. HP, 3000 Hanover St., Palo Alto,

Calif. 94304.

#### INSOURCE CORP.

Prestel Terminal Emulation diskettes

Insource Corp. has introduced its videotex family of Prestel Terminal Emulation communication diskettes for the IBM Personal Computer, Apple Computer, Inc. micros and Commodore Business Machines, Inc. Commodore 64.

According to the vendor, the fullcolor videotex software features an automatic dialing technique and a stored account number and password that allows for simplified login at 300 or 1,200 bit/sec to Insource or any other videotex system operator using Prestel.

The videotex software sells for \$199.

Insource, 110 Heritage Sq., 4825 LBJ Freeway, Dallas, Texas 75234.

#### IDEAWARE, INC. Graffix Idea

Ideaware, Inc. has introduced the Grafix Idea, a system of three software packages that allows business users to use IBM Personal Computers and compatible microcomputers to act as slide or overhead projectors.

According to the vendor, the slide shows can contain not only graphics images, but also images of text screens such as spreadsheets.

In addition to labeling and titling capabilities, the sketch pad can draw illustrations and flowcharts, with numerous choices of background color, text size and orientation on the

The suggested retail price for the package is \$79.95.

Ideaware, Suite 712, 225 La-fayette St., New York, N.Y. 10012.

#### TERRAPIN, INC. Logo Version 2.0

Terrapin, Inc. has introduced Version 2.0 of its Logo language for the Apple Computer, Inc. Apple II, II+ and Ile.

Enhancements over the current Version 1.3 include improved "gar-bage collection" capabilities, support for all four cursor keys on the He and the ability to read program files created under Logo.

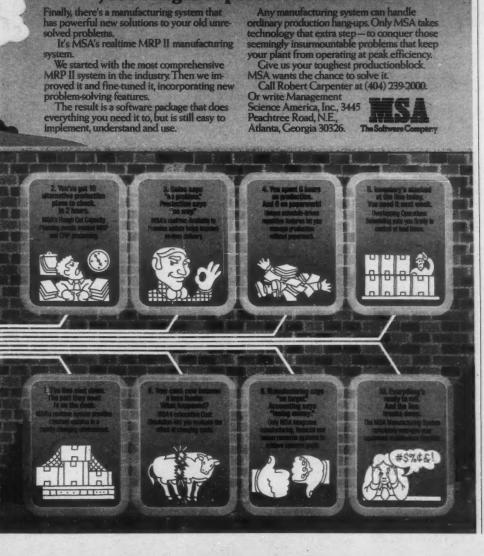
Terrapin has also announced enhanced documentation with a "Words and Lists" chapter in the Logo manual, including recursion, interactive graphics, quizzes, word games and artificial intelligence programming.

The price for the Logo package is \$149.95. The "Words and Lists" chapter is priced at \$12.50.

Owners of Version 1.3 may update to Version 2.0 for \$20 and obtain the 'Words and Lists" chapter for \$5, the vendor said.

Terrapin, 380 Green St., Cambridge, Mass. 02139.

See MICRO page BR



#### MICRO from page 87

OPUS CORP. WS250

Opus Corp. has introduced a workstation emulator that allows an IBM Personal Computer or Personal Computer XT to act as a Hewlett-Packard Co. HP 250.

The WS250 features screen-labeled soft keys and emulation of HP forms and video enhancements. Also included is an Ascii and Ansi mode for autodial modem control, local printer support and logging and sending data to disk files.

The single-quantity price of the WS250 is \$500.

Opus, 20251 Century Blvd., Germantown, Md. 20874.

## COMPUVIEW PRODUCTS, INC. Vgraph

Compuview Products, Inc. has introduced Vgraph, a package that is designed for industrial and engineering sites as well as for computer-aided design and manufacturing installations.

According to the vendor, Vgraph emulates a Tektronix, Inc. 4010 graphics display terminal.

It supports the Zenith Data Systems Corp. Z100 and Victor Technologies, Inc. Victor 9000 microcomputers. the vendor said.

The Vgraph disk and manual are priced at \$120, according to the vendor.

Compuview Products, Suite 300, 1955 Pauline Blvd., Ann Arbor, Mich. 48103.

## ASSOCIATED TECHNOLOGY, INC.

Software Resources

Associated Technology, Inc. has introduced Software Resources, a package that computes optimum resource levels for development projects on IBM Personal Computers or compatible microcomputers.

According to the vendor, the software manager can perform "what-if" studies to determine varying schedule lengths, staff levels, peak staffing, program size, documentation, coding environments, testing environments and 12 other development parameters.

The tool can provide project optimization for software projects requiring 10 to 5,000 man-months of effort, the company said.

The system is described in a user manual that costs \$30. The program and manual are available for \$175.

Associated Technology, Rt. 2, Box 448, Estill Springs, Tenn. 37330.

#### MICROTEC RESEARCH, INC. Paragon enhancement

Microtec Research, Inc. has announced that its line of Paragon cross-assembler systems for microprocessor developers is now available for use on the IBM Personal Computer.

According to the vendor, each assembler includes a library and download utilities. It contains a macro facility, conditional assembly options, list-control operators and cross-reference listing.

Assembler systems are available for most 8-bit and 16-bit micro-processors.

The products require IBM's PC-DOS or Microsoft, Inc.'s MS-DOS Release 1.1 or 2.0 with 128K bytes of random-access memory.

Individual CPU license prices are \$600 for 8-bit processors and \$900 for 16-bit processors. Microtec Research, No. 325, 505 W.

Microtec Research, No. 325, 505 V Olive, Sunnyvale, Calif. 94086.

#### MONUMENT COMPUTER SERVICE Report Writer Jr.

Monument Computer Service has introduced Report Writer Jr., a word processing package for the IBM PCjr.

According to the vendor, the program was designed for those who wish to use a PCjr away from the office and later transfer the data directly to an IBM Personal Computer. The program is compatible with many word processor programs and can be used with standard IBM PC-DOS-oriented spelling check programs, the company said.

The Report Writer Jr. requires an

The Report Writer Jr. requires an IBM PCjr with 128K bytes of memory and a single disk drive. Both IBM graphics and thermal printers can be used with the system, but are not required.

The price of Report Writer Jr. is \$80.

Monument Computer Service, P.O. Box 603, Joshua Tree, Calif. 92252.

#### SOFTWARE SOLUTIONS, INC. Datacase Version 2

Software Solutions, Inc. has introduced Version 2 of its Dataease relational data base management system for the IBM Personal Computer using IBM's PC-DOS Release 2.0 operating system.

According to the vendor, the product can be menu-driven for novices or worked in the program's expert mode.

It allows the user to obtain information from a large number of files and derive data fields based on information in other fields. It can be used to interpret and manipulate large data bases, the company said.

The product was originally designed for use with Microsoft, Inc.'s MS-DOS Release 2.0 operating system and is also available for Digital Equipment Corp.'s Rainbow, Wang Laboratories, Inc.'s Professional and Texas Instruments, Inc.'s Professional microcomputers. The package costs \$595, the vendor said.

Software Solutions, 305 Bic Drive, Milford, Conn. 06460.



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professions can benefit from SALVO. Regardless of their level of expertise.

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## MICROCOMPUTERS

## WINDOW from page 69

while a data base sort is completed." The number of windows offered by various packages typically runs from four to seven. But how many

can the user use at one time? "Most of our users monitor two or three windows concurrently," Gysin

We found that a person has trouble monitoring more than two or three functions," said Joseph Brophy, senior vice-president of data processing at Travelers Insurance Co.

in Hartford, Conn.
Users who try to monitor six or seven windows often find their productivity deteriorating rather than improving. "There has to be a point where too many windows detracts from its usefulness," Gysin said.

While it is fairly easy to share data among windowed microcomputer programs, when mainframe data is incorporated into the windowing process, the task becomes more com-plicated. Only one of the current windowing software offerings, the one used in IBM's 3270 Personal Computer, offers windows that directly ac-

ss mainframe data. "With the 3270 Personal Computer, a user can access mainframe data, but it is not easy to use that data with Lotus Development Corp.'s Lotus 1-2-3 or other microcomputer applications," said Ron Goldfarb, manager for office automation at Pratt & Whitney Aircraft Co., based in Hartford. A complicated cut-and-paste procedure is needed to use mainframe data with a microcomputer application, he added.

"While these products are designed for professional managers, I am not sure they spend enough time with a personal computer to benefit from windowing capabilities," Antonellis said.

Managers may not like other win-dowing features. Many windowing applications use icons to represent functions. For example, a picture of a notepad might be used to represent a buffer. "Icons are useful for some us-ers," Gysin said. "Other users may find them insulting.

"Windowing will prove to be via-ble for some applications," he said. "Currently, it is the focus of almost every manufacturer's and independent software vendor's development. As other technologies mature, this trend will taper off, but windowing will not disappear.

## PIRACY from page 69

of software for microcomputers. Some questions, such as whether software can be rented or loaned (in the case of libraries) will probably have to be settled in court unless Congress is willing to bite the bullet and come up with a legislative solu-

In order to inhibit unauthorized copying, software houses are using various techniques to copy-protect their programs. This approach to the problem is particularly annoying when attempting to produce an inte-grated set of software in an organizational environment. It obviously becomes difficult, or impossible, to integrate various programs with menu or windowing systems. This problem is subject to market pressures, however. If consumers, whether individual or corporate, will refrain, as a matter of policy, from buying copy-protected software, software houses will soon see the er

ror of their ways.

After all is said and done, software piracy may not be as significant as some software houses would lead us to believe. It is a problem because of the moral and ethical implications involved (although these are neither neat nor clean). But in attempting to deal with the issue, we should be-ware of oversimplifying the problem and dealing with it in inappropriate

Finally, software houses must meet the challenge of the software needs of large organizations. Such organizations are often willing to pay a substantial fee for a site license if one is available. And quantity or educais available. And quantity or educa-tional discounts probably do not serve the same purpose as site li-censes. When dealing with large or-ganizations, software houses must come up with creative marketing techniques. The alternative is for those organizations, as policy, to buy software from manufacturers which have such policies, or in the worst case, for individuals within such organizations to obtain unauthorized copies of the software in the mistaken belief that they are saving the organization money.

Madron is manager of Computer Services at North Texas State University, Denton, Texas.

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## MICRO from page 88

INTEL CORP.

Intel Corp. has announced a general-purpose operating system kernel for its supermicrocomputer, the IAPX 286.

Dubbed the K286, the kernel reportedly gives operating system designers an interface to all the archisigners an interface to an the architectural features of the IAPX 286, such as multitasking capabilities, memory management and protection and 16 byte of virtual memory.

The K286 was reportedly designed

for real-time industrial automation systems, communications systems such as automated private branch ex-

changes and business systems.

The product will be ready for release in July. It costs \$27,000 for a one-time license fee, including one

year of factory support.
Intel, 3065 Bowers
Clara, Calif. 95051. rs Ave., Santa

# Lotus: Expected to hit No. 2 spot

With the scheduled

announcement last week of the successor

## OUTSIDE

to 1-2-3, Lotus Development Corp. has enhanced its formidable market position and is projected to ride suc-

cess to No. Two on the ladder of top software companies. That's No. Two among all software companies, not just vendors of micro products.

The investment firm of L.F. Rothschild, Unterberg, Towbin recently predicted that Lotus in 1984 will bring in revenues of \$165.7 million, topping Cullinet Software, Inc. and Microsoft, Inc. and coming up just short of Management Science America, Inc.

Science America, Inc.
Without a doubt, Lotus is the prime example of how the marketplace establishes a standard and the potential riches that can come to those who successfully ride the dynamics of the exploding microcomputer market.

The company raised \$1 million in financing in early 1982 and introduced its product in October of the same year, actually shipping the product in January of last year. Less than two weeks ago, Lotus released its annual report showing profits of \$14.3 million on revenues of \$53 million.

#### Keys to success

The keys to success were: a solid, state-of-the-art package besting anything then in the field, reliability, canny marketing, timely delivery and solid management.

With IBM expected to ship in excess of two million micros in 1984, and IBMcompatibles adding another solid contribution, plus the potential of Apple Computer, Inc.'s Macintosh, Lotus is in fine shape and serves as a mentor to many other would-be overnight success stories.

There will be problems, however, for the new entrepreneurs.

Foremost, where Lotus established a standard by shipping 90,000 packages in See LOTUS page 98

Data base task too complex?

Bank software firms see red

#### By Paul Korzaniowski CW Staff

For some application software developers, the road leading to the kingdom of online, integrated, central data base systems is scarred with huge potholes.

One case in point is Anacomp, Inc., the Indianapolis-based company that is developing the Continuous Integrated System (CIS), an on-line, data base system for banks. The month of January represented the company's high and low points; in the space of that month, it delivered both a pilot version of CIS to the Provident National Bank in Philadelphia and defaulted on a \$45 million lending agreement with five banks.

The default was attributed to CIS cost overruns and missed deadlines by Anacomp, which expects to report quarterly losses through the first nine months of 1984. Provident National Bank officials refuse to comment on the pilot project.

But Anacomp's problems are hardly unique. Other vendors have also missed delivery dates, raised prices and rewritten specs during the development of their data base systems.

Insurance Service of America, Inc. (ISA), for example, attempted to develop an on-line data base system for commercial insurance policies. After cost overruns and missed deadlines and before the project's completion, the system was sold to Advanced Technology, Inc., a division of Maryland Casualty Co.

#### A promise of the '70s

The desire for large on-line data base systems emerged in the mid-1970s. The systems promised to make complete, up-to-the-minute customer information instantly available. "The customer wants one statement with checking, Visa and mortage information." said William Conklin, an independent consultant in Boston.

Major data processing shops, among them those in financial institutions, began looking at these systems. "A company must develop this type of system to keep pace with its competitors," said Ronald G. Ross, editor of "Data Base News," a Marblehead, Mass., publication. "Any combined of the processing of the processing

# I SA

The Software Company

Management Science America, Inc. opens West Coast sales office to provide single source for their own software and products from other vendors/94

Large systems still count, IBM tells shareholders in annual report stressing conservative management/97

## INSIDE

■ Harris Corp. focuses word processing strategy around units from recently acquired Lanier Business Products, Inc./94

■ Longstanding dispute heats up between Software Arts Products Corp. and Visicorp over marketing of Visicalc and next generation/96

## Six indicted in alleged Apple scam

#### By Patricia Keefe CW Staff

PHILADELPHIA — A federal grand jury here recently returned two separate indictments against six individuals and five companies, charging them with criminal conspiracy and smuggling of computer parts into the U.S. from Taiwan. Those parts are alleged to be counterfeit Apple Computer, Inc. Apple II components. Information from the year-long Phila-

Information from the year-long Philadelphia investigation was funneled through U.S. Customs' Operation Tripwire, resulting in seizures of smuggled, allegedly counterfeit Apple computers in New England, San Francisco and Los Angeles, according to David E. Warren, special agent-in-charge of U.S. Customs Service here.

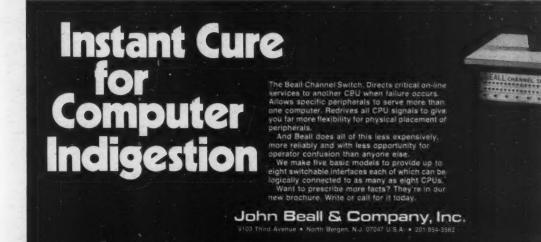
Operation Tripwire seeks to stop the importation of foreign-manufactured goods

that infringe upon U.S. copyrights and trademarks. Warren explained that Customs believes there is a link between these operations, and that it is possible several of the six indicted here may be ring leaders.

The indictments marked "the first time a case has been brought for a customs violation [smuggling] in connection with the importation of computers that are copies of computers manufactured in the U.S.," according to the U.S. District Attorney's office here. (Although U.S. Customs officials raided three California companies last month, netting 1,000 Apple II lookalikes, no charges have been filed as yet.) Although "there can be no doubt" that

Although "there can be no doubt" that the Philadelphia defendants were importing counterfeit Apple II components, the U.S. District Attorney's office here does

See APPLE page 98



## MSA division to distribute micro software

By Jeffry Beeler

LOS ANGELES — Management Science America, Inc. (MSA) has opened an additional sales division in a move designed to aid information systems directors in stemming the spread of incompatible microcomputer programs within large corporations.

MSA's Micro Distribution Division (MDD) will serve as an additional sales arm both for the company's own Peachtree Software, Inc. subsidiary and for many rival publishers of microcomputer applications as well, the company said.

MDD, headquartered here, will evaluate a host of programs representing each of the major generic categories of commercial personal computer applications — spreadsheets, word processing, graphics, communications, accounting, data base management, project scheduling and windowing. The ultimate aim of the exercise is to identify the top three or four big-business-oriented packages in each category, according to the company's senior vice-president, Howard Smith Jr.

Although at least a few of the cho-

Although at least a few of the chosen applications will undoubtedly bear Peachtree's label, the majority will be supplied by other vendors, Smith said. All the packages, however, will be required to run on IBM or IBM-compatible personal computers.

Once a particular product has won MSA's final approval, MDD will buy and warehouse multiple copies of the program. Through its own independent sales staff, the division will then approach large corporations throughout the U.S., offer to analyze their total systems environments and supply the right combination of micro software packages to meet their individual needs.

To take advantage of MDD's services, however, clients will have to

commit to buying at least \$100,000 worth of personal computer applications per year. "Companies that spend less than that amount for microcomputer software will probably continue to buy through traditional sources like retail stores," Smith said.

In addition to selling a wide variety of personal computer packages, the division will serve as a liaison between its customers and its cooperating publishers' support staffs. MSA is thus striving to offer big business a much needed single source, not only for all its microcomputer software, but also for all its maintenance and user training, Smith said.

Single sourcing, in turn, will enable MIS managers to control tightly their companies' software purchases, avoid the installation of incompatible systems and, therefore, promote the adoption of effective personal computer standards, he added.

MDD will also provide large corporate accounts with several other software-related services, including:

ware-related services, including:
■ Pricing discounts typically ranging from 15% to 30%.

■ A series of nationwide, quarterly forums that will give customers an opportunity to discuss their personal computer applications needs with many of the industry's leading program publishers.

gram publishers.

An IBM Personal Computer-compatible add-on board with a pre-recorded tutorial and a voice-synthesis unit that together will teach microcomputer operators how to use each MDD-supported applications.

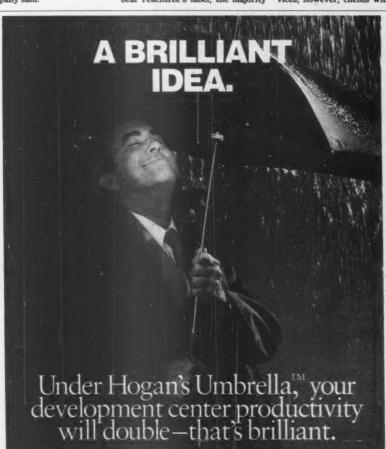
each MDD-supported application. Formation of MSA's latest division follows the completion of a recent survey in which MSA sought to analyze the microcomputer installations and needs of the 2,000 largest corporations in the U.S. The study reportedly uncovered a widespread dissatisfaction with traditional methods of acquiring microcomputer software.

"Many big companies still buy most of their microcomputer programs through their local computer stores, but they're not entirely pleased with that arrangement. Smith said. "They dislike having to deal separately with five or six different vendors and would much rather get all their software, service and support from the same source."

## Harris strategy to target Lanier

MELBOURNE, Fla. — Harris Corp. announced recently that its strategy in the word processing market will focus on the products of its recently acquired subsidiary, Lanier Business Products, Inc., and that Lanier's One-Step software package will be the companywide word processing standard for all Harris information systems.

Harris will also present its Harrisnet local-area network architecture as the standard networking architecture for all Harris and Lanier information system products. That architecture, according to the company, will be applied first to the Lanier



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# Semi bookings for U.S. mart forecast to slip

By Robert Batt CW West Coast Bure

NEWPORT BEACH, Calif. - After reaching record levels in the fourth quarter of 1983, semiconductor bookfor the U.S. market will decline by 12% in the first three months of this year, according to In-Stat, Inc.

In a report presented to the Seventh Annual Information Services seminar, sponsored by the Semicon-ductor Equipment and Materials In-stitute, Inc., In-Stat said bookings for the U.S. market will decline from a total of \$3.1 billion in the fourth quarter to \$2.7 billion in the current

Addressing the seminar, Jack Beedle, president of the Scottsdale, Arizbased market research firm, said the "splurge" in the last three months of '83 witnessed many manufacturers becoming increasingly gun-shy about product shortages, placing annual purchase orders in an effort to ensure sufficient products to meet rapidly increasing sales forecasts for

December semiconductor bookings, he claimed, leaped by \$100 million over November levels to \$1.1 bilwhile sales moved up to \$680

While there will be a relative downturn in the first quarter of 1984, Beedle predicted that semiconductor bookings will still increase by 20% for the year, after increasing 68% in 1983.

He said a smaller book-to-bill ratio this year will allow both suppliers and end users to schedule products more effectively.

At a press conference following e seminar, Beedle claimed 1984 should be a strong year for U.S. semiconductor manufacturers as compared with their Japanese counter-

Japanese manufacturers

## HARRIS from page 94

5000 series and a new family of Harris distributed data processing systems and later to Harris superminicomputers, interactive and remote job-entry terminals as well as to a new generation of integrated voice and data private branch exchange products.

John T. Hartley, president of Harris, said the company has refined its market focus to take advantage of Lanier's installed base of 55,000 stand-alone word processing units and will concentrate on the recently sed Lanier Business Process 1000 and the Business System 5000 clustered network as its building blocks in the word processing mar

Harris also announced its Distributed Office Systems Division will be separated into its original two components: the Harris Distributed Products Division, to be headquartered in Dallas and managed by J. Whitney Haney, who was previously responsi-ble for the Distributed Office Systems Division; and the Word Process ing Division, based here under Lanier Business Products and reporting to William J. Kelly, vice-president of research and development for Lanier.

have serious problems at the moment. They are hard pressed to sup-ply their own clients due to the vertically integrated nature of their organizations and because of the treendous amount of Japanese chip manufacturers that are trying to ener the lucrative computer industry,"

Citing more good news for U.S. vendors, Beedle asserted that domestic suppliers are now mounting a via ble challenge to Japanese dominance in the 64K-byte dynamic random-acs memory (RAM) market. A prime

example, according to Beedle, is Mostek Corp., which "came from nowhere to become the world's third-largest manufacturer of 64K dynamic RAMs."

Remarking on the state of the industry, James Webster, director of product program management at IBM's General Technology Division, said the biggest single force in improving price/performance in the proving price/performance in the march of computer industry is the march of technology.

That IBM has been able to make price/performance improvements in the region of 20% a year is due almost entirely to the fact that semiconductor technology is growing at an even ster rate than the DP industry itself, he asserted.

self, he asserted.

But Dan Rose, president of the Los
Altos, Calif.-based consulting firm
Rose Associates, Inc., told attendees
at the post-seminar press conference that a string of recent economic indi-cators heralds the possibility of a downturn in the economy at a time of record backlogs for chip manufactur-

The expectations of spectacular growth in the industry during the next four years may therefore turn out to be premature, according to

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## 'Visicalc' lawsuits proliferate

BOSTON — Lawsuits between Software Arts Products Corp. in Wellesley, Mass., and Visicorp in San Jose, Calif., have proliferated in recent weeks, as a long-standing disagreement between the two firms has heated up.

On Feb. 10, Visicorp was denied a temporary restraining order that would have prevented Software Arts from using the trademarks "Visi," "Visicale" and "Visicale Advanced Version."

Visicorp's suit was filed in response to an answer and counterclaims filed by Software Arts on Feb. 7. This answer amended a countersuit Software Arts filed here last fall and charged Visicorp with breach of contract, while seeking to terminate an agreement that allows Visicorp to market Visicale.

The agreement, signed in 1979, allowed Visicory to market Visicale, a spread-sheet program developed by Software Arts. In 1979, the program ran only on Apple Computer, Inc.'s Apple II microcomputer. Under the agreement, Software Arts was responsible for enhancing Visicale and tailoring it to other microcomputers.

Last September, Visicorp filed suit in a California court claiming that Software Arts was late delivering new versions of Visicalc for a number of microcomputers, including the IBM Personal Computer. Visicorp accused Software Arts of using moneye armarked for Visicalc enhancements to develop TKSsolver, an equation processor.

Software Arts denied the charges and countersued Visicorp for nonpayment of royalties, not promoting Visicalc to the best of its ability and developing Visioncalc, which runs under Visicorp's Visi-On. Software Arts claimed that Visioncalc is an enhanced Visicalc — so Visi-corp should have offered Software Arts the opportunity to develop the program and that Visicorp should pay Software Arts royalties for the product. However, Visi-corp claimed that the prodwas developed from scratch.

Software Arts has indicated that it plans to market Visicalc with its own trademark. "One of the bylaws in the 1979 agreement states that if a breach of contract occurs, the Visicalc trademark reverts to Software Arts," said Thomas Moffei, a lawyer for the Boston firm of Choate, Hall & Stewart, which is representing Software Arts.

## M&D to market Software International's

NATICK, Mass. — In a move intended to skirt an injunction that has frozen international sales of McCormack & Dodge Corp.'s (M&D) G/L Plus general ledger package, M&D last week entered into an agreement with Software International, Inc. of Andover, Mass., for international marketing rights to

Software International's The System report writer subsystem.

The System is substantially similar to Fast, a report writer developed by ABC Management Systems, Inc. of Bellingham, Wash., and sold by M&D as part of G/L Plus.

M&D has been enjoined from selling Fast internation-

ally as the result of a suit brought by ABC last year. In November, a superior court judge imposed the injunction and awarded \$2.5 million to ABC [CW, Dec. 5]. The judge also awarded \$300,000 to Software International for reimbursement of expenses incurred in fighting a countersuit by M&D against ABC and Software International. On Feb. 1, a state appeals court upheld the injunction against M&D.

An M&D spokesman said the agreement with Software International, which is valued at over \$1 million, will effectively settle all claims between the two vendors. However, an appeal by M&D



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## 'The System' in effort to avoid 'Fast' injunction

is still pending in its litiga-tion with ABC.

If the agreement is If the agreement is approved by the court, M&D will offer The System as a subset of C/L Division and a subset of G/L Plus. However, the software must undergo modifications, a process which could take several months. The spokesman said the deal was negotiated so

that M&D international sales representatives could continue to market G/L Plus with the promise that a Fast look-alike would be available soon. M&D has also pledged to replace the Fast subsys-tem with its own report writer sometime in the third quarter of this year. M&D Chairman James M.

McCormack said the deal was negotiated after attempts to reach an out-of-court settlement with ABC had failed. 'It became clear after extensive negotiations that there was no interest from ABC Management Systems in a reasonable settlement of this dispute," he said.

That's an absolute lie,"

commented Vernon Ruskin, president of ABC. "We offered them a settlement over a month ago, and we haven't heard from them since. They haven't negotiated serious-ly." The M&D spokesman would not comment on Rus-

kin's countercharge. Ruskin estimated it would take six months for M&D to modify The System, which is based on a later version of the ABC report writer, for use with G/L Plus. "I don't see how they could market [The System] without making those changes," he said. Ruskin added that ABC lawyers believe the agreement bebelieve the agreement be-tween M&D and Software International is "not feasible."

## IBM aiming to reassure bondholders

ARMONK, N.Y. — Despite its rapid and profitable domination of the microcomputer market, IBM's "large systems still account for a substantial portion of revenue," the com-pany reported in a just-released annual report aimed at reassuring shareholders of a continued con management style. conservative

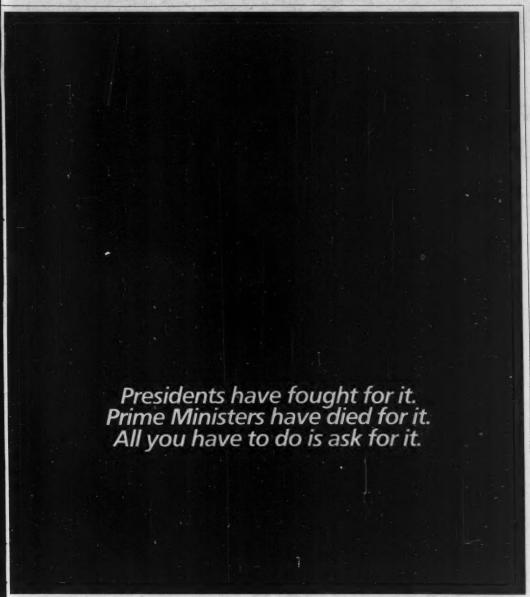
"Management is mindful of the risks inherent in high technology, the growing scope and quality of competition and uncertain economic conditions," IBM's report said. A major consideration of management is conservation of capital. In 1983, according to the report, IBM increased its cash on hand and marketable securities to \$5.5 billion, up from \$3.3 billion in 1982, and at the end of the year had accumulated total working capital of \$7.7 bil-lion, up from \$4.8 billion at

Along with that increase in liquidity, the company continued to decrease its investment in equipment for rentals, "consistent with the changing character of our business," decreasing that decreasing that portion of its assets before depreciation to \$13.4 billion, down from \$16.5 billion in 1982. Revenues from rentals declined about 17% to \$9.2

the end of 1982.

A key management strate gy, according to the report, is cost control through mized productivity, and IBM held increased investment in plant and other property to 6% over the previous year, as general and administrative expenses climbed 14% and research and development expenditures climbed 17%.

A further indication IBM's strategy of keeping its assets liquid was the disclo-sure that IBM Credit Corp. increased its purchases of installment payment agreements from the parent com-pany to \$848 million in 1983, up from \$682 million in 1982, and purchased \$334 million of IBM products for term lease customers, up from \$67 million in 1982.



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## Computer counterfeiters gaining in numbers

During fiscal 1983 and the first quarter of fiscal 1984, over \$9.2 million of counterfeit computers were seized by U.S. Customs Service officials throughout the U.S., estimated Special Agent-in-Charge David E. Warren of the Philadelphia office of the Customs Service

Apple Computer, Inc.'s Apple II and II+ and video games have been among the primary targets of computer counterfeiters. Even industry giant IBM is beginning to experience problems and has recently regis-tered some copyrights with Customs, according to Gary Hecker, a copyright and patent attorney rep-

In Taiwan alone, there are five to 10 major companies manufacturing counterfeit computers and literally hundreds of smaller manufacturing and trading companies as well, Hecker estimates.

Counterfeiters are so numerous that fake Apples actually outsell the real thing 10 to one in Taiwan, the attorney said.

Among the variety of ways counterfeiters are attempting to evade

detection by the Customs Service:

Concealing components in shipments of other goods, like heavy machinery.

Sending computer components

in separate packages, via air mail and air freight, to private resi-dences or separate addresses. ■ Falsifying package labeling as to contents and value or falsifying

cargo documentation.

■ Shipping completed computers minus printed-circuit boards or read-only memories, which are shipped under separate cover.

## APPLE from page 93

not intend to pursue the issue of copyright infringement, according to Ewald Zittlau, an assistant U.S. district attorney handling the case. Instead, Apple will have to decide whether to pursue any alleged copyright violations through civil litigation has an explanation and an allege processors. tion, he said. An Apple spokeswoman said the vendor is considering such

However, Zittlau said "there is no question that they [the defendants] had it in mind that they could not get these components into the U.S. unless they concealed them in other shipthey concealed them in other ship-ments or by mislabeling packages and, in some cases, addressing these packages to their homes." Zittlau noted that when "you turn the las-sembled computer] on, it says 'Ap-ple.'" And, he added, the parts are so similar, that when placing their or-ders, the defendants asked for Apple Il narts.

An initial tipoff from Apple about illegal sales in the area included one company that was already under investigation for other customs viola-Warren said. Four of the six in Philadelphia were nabbed via a sting operation involving local police, cusns officials and some technical as-

sistance from Apple.

The first indictment concerns Alberto K. Chua and Alfonso D. Keh and their three import companies.
The two men are each charged with four counts of smuggling and one count of conspiracy. Specifically, they are accused of smuggling countered in the second of smuggling countered in the second of smuggling countered. terfeit Apple II parts into the U.S. and selling them to Joel M. Isadore and Daniel Ryan.

Chua and Keh each face a maximum prison sentence of 25 years and a maximum fine of \$50,000. Their three companies are each charged with one count of conspiracy; two of the three are also charged with two counts of smuggling and face a maxi-mum fine of \$30,000, and the other

faces a maximum fine of \$10,000.
Isadore is also charged with conspiracy in the second indictment, which concerns the alleged activities of Robert Ellis, his two import companies. nies and his son David. The senior Ellis is charged with four counts of smuggling and one count of conspiracy and faces the same penalties as Chua and Keh.

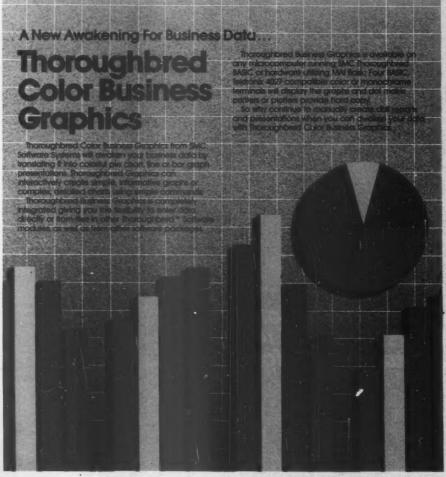
Ellis is alleged to have asked Tai-wanese manufacturers to send fake Apple II parts via air-mail parcel post in mislabeled packages, such as "electric part samples, no commercial value." The indictment further alleges that the three men received counterfeit Apple parts and assembled look-alike computers from February to April 1983.

## LOTUS from page 93

the first quarter of 1983 and 160,000 in the second quarter, the newcomers are going to have to ship in the hundreds of thousands, and do it quickly in able to corner the marketplace before new developments overtake

Secondly, as the competition heats up it's going to take many more mil-lions of dollars to market a new product successfully.

So there are likely to be few Lotuses in the future and more and more software developers signing up to established muscle, like Microsoft, and maybe even Lotus itself.



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## NICKELS & DIMES

Compaq Computer Corp. posted a yearly profit of \$4.7 million, or 24 cents per share on sales of \$111 million during 1983, its first year of op-eration. Profit in the fourth quarter totaled \$5.3 million on sales of \$52 million.

Vector Graphic, Inc. announced its results for the second quarter, posting a \$1.9 million loss on sales of just \$3.3 million, compared with a profit of \$107,000 and sales of \$11.9 million posted during the same period a year ago.

The Ultimate Corp. has announced third-quarter revenues of \$18.5 million and earnings of \$2.7 million, or 28 cents per share, up 75% and 116%, respectively, over the same period last year.

Computer Task Group, Inc. has reported revenues for 1983 of \$54.2 million, up from \$40.1 million a year ago. Earnings increased 27% to \$1.5 million.

Perkin-Elmer Corp. re-cently reported second-quar-ter profits of \$14 million, or 32 cents per share, up 38% over the same period a year ago, on revenues of \$288.7 million, up 6% over the yearearlier figure. Profits for the first six months of fiscal year 1984 were up just \$1.5 million over the previous year, reflecting a poor first quarter in 1984 when profits were \$8.6 million, down \$2.3 million from the year-earlier benchmark, on revenues of \$248 million.

Computer Consoles, Inc. has reported that revenues for 1983 rose 31% to \$103.6 million, up from \$79.1 million for 1982. Net income was \$10.4 million, or 87 cents per share, up 40% from \$7.4 million, or 66 cents per share, in the prior year.



Cray Research, Inc. has reported revenues of \$82.8 million and earnings of \$19.3 million, or \$1.31 per share, for the fourth quarter ended Dec. 31, compared with revenues of \$62.6 million and earnings of \$12.2 million, or 87 cents per share, for the comparable period last year.

Electronic Data Systems Corp.'s earnings per share for the second quarter of fis-cal year 1984 were 31 cents per share, up 24% from the same period last year. Quar-terly revenues rose 22% to \$189.6 million, and profits were up 24% to \$17.5 million.

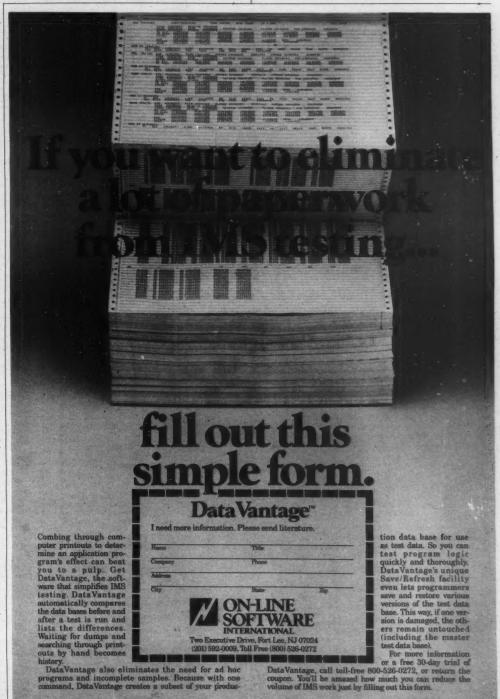
Prime Computer, Inc. re-cently announced it had successfully renegotiated its \$100 million line of credit with six major banks, extending the initial agreement through 1991 and reducing borrowing costs and compliance requirements.

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## ON-LINE from page 93

pany using technology must incorporate the latest technical developments into its operation."

Realizing how complex on-line data base systems are, some companies joined forces with application vendors to design these systems. But few banks, insurance or financial companies had any experience designing and implementing data base systems. They underestimated the cost and complexity of the projects.

"Millions of dollars were thrown away developing elaborate on-line data base systems that were never delivered," said Michael Salzberg, principal at the Plagman Group, Inc., a New York consulting firm specializing in data base technology. "Problems arise when users with diverse

needs access the same data."

Design methods, not technical limitations, create problems. "Some vendors and data processing departments undersold the difficulty of designing these systems," Ross said. "Even with technical advances, companies must take a comprehensive analytical look at system needs, set realistic expectations and be totally committed to the system.

"The technology can be improved, but problems surface from the scope and design of the system. Many companies do not have the proper administrative structure in place to design and implement these systems."

In some cases, project control slipped away. "These are huge systems, too large for one person to design," Ross said. "Since this is the nature of the beast, conventional design

approaches won't work. Implementation has to be different. Each module has to fit into the system. There has to be division of labor to ensure that the system is well designed."

Conventional programmers often do not have the proper tools to design these systems. "Data processing managers have to retrain their people," said Dan Nolan of Heuristic Development in Annandale, Va.

"Data processing departments must invest in their people. No one works with hexadecimal anymore. They must stop programming in Cobol and other languages and work with the new natural languages," he said

Another problem is that vendors often build too many features into the system. "There were features in the [Anacomp] CIS system that were

not needed," said Conklin. "It had features like simultaneous batch and on-line processing, which a bank doesn't need. Anacomp built the system so that it was easy to sell and maintain."

Hogan Systems, Inc. in Dallas succeeded where Anacomp failed. Its online banking system, less ambitious than the Anacomp system, is up and running.

Grandiose design also haunted Insurance Systems of America, Inc.'s system. After purchasing the system, Maryland Casualty changed system specifications and delivery dates. "Since the sale, there has been an improvement in meeting delivery dates," said Lawrence Bacon, second vice-president of data processing at Travelers' Insurance Co. "The quote portion of the general liability system is up and running in 78 Travelers' service offices."

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Reynolds & Reynolds Co. has announced an agreement with NCR Corp. in which NCR will provide advanced computers as new additions to Reynolds' line of VIM/NET Systems. Under the two-year agreement, Reynolds will purchase approximately \$20 million in enhanced models of NCR's Tower 1632 data processing units. Reynolds will market the units as part of a configuration for very large vehicle dealers.

Dr. John McCarthy, creator of the Lisp programming language, and Dr. Douglas Lenat, professor of Computer Science at Stanford University, have been named to the newly formed Scientific Advisory Board at Inference Corp., an artificial intelligence company.

Western Union has been awarded a contract by Eastern Airlines to provide its Easylink electronic mail service to subscribers to Eastern's automated reservations and ticketing system, the System One Direct Access System, over a three-year period beginning this spring.

Warner Software, Inc. has acquired all publishing, marketing and licensing rights to The Desk Organizer, a desk management software product for the IBM Personal Computer, developed by Conceptual Instruments Co.

AT&T Information Systems, Inc. and United Technologies Building Systems Co. have announced an agreement in principle for forming a joint venture. The new venture will offer information services to the tenants and the owner/managers of multi-tenant commercial buildings.

AT&T Information Systems, Inc. and Hewlett-Packard Co. have completed joint certification testing of HP 3000 Business Computers, HP 150 Personal Computers and HP data terminals to ensure compatibility with AT&T Information System's Dimension System 85.

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OS/VS Systems Software Developer will develop and maintain the SAS supervisor and related components for the IBM OS/VS and MVS/XA environments. Use of IBM 370

Assembler as a programming language and exposure to OS/NS supervisor and data management service macros are required. Experience with the development and support of large software systems and the use of IBM service aids is desirable. Familiarity with operating system concepts, compiler design and implementation, PL/I, and the SAS System are significant assets. A bachelor's degree, preferably in computer science, or equivalent is required.

Compiler Systems Developer will be responsible for the design and implementation of a PL/I-like compiler. Applicants must have a MS in computer science or mathematics and a strong background in block structured languages, preferably in PL/I. Experience in design and construction of state-of-the-art compilers and familiarity with optimization and code generation issues are required.

Communications Systems Software Developer will develop and maintain the SAS supervisor components for the IBM MVS, VMCMS, and VSE environments that interface to communications terminals and access methods, such as the 3279, 3287, 3288, and ACF/VTAM. Use of IBM 370 Assembler as a programming language and knowledge of SNA protocols, 3270 data streams, and MVS or CMS supervisor services macros are required. Experience with the development and support of large software systems and the use of VTAM/NCP service aids is desirable. Familiarity with PL/I and the SAS System are significant assets. A bachelor's degree, preferably in computer science, or equivalent experience is required.

Microcomputer Software Developer will design and develop the SAS System for microcomputers. Applicants must have indepth knowledge of 8086 Assembler language, C language, and IBM PC-DOS BIOS. A bachelor's degree in computer science or equivalent experience is required. Experience with full-screen and graphics drivers is highly desirable. Applicants must provide samples of related work experience.

UNIX Minicomputer Developer will be responsible for helping develop SAS software to run under UNIX. Applicants must have 3 to 4 years of experience with C language and UNIX. A bachelor's degree in computer science or a related field is required. Experience with minicomputers, knowledge of PL/I, and SAS software is highly desirable.

VAX/VMS Systems Programmer will assist in development of host routines and SAS interface routines for Digital VAX systems. Applicants must have at least two years' experience with VMS and Macro-11. PL/I programming experience is a significant

Systems Developer will assist the development of the SAS System on various minicomputer systems. Applicants must have a minimum of two years' PL/I programming experience and working knowledge of SAS software. Experience with one of the following minicomputer systems: Digital VAX under VMS, DG MV under AOS/NS, or Prime under PRIMOS is desirable. A BS in computer science is required. Knowledge of SAS/GRAPH and SAS statistical procedures is desirable.

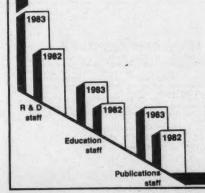
Testing & Documentation Systems Programmer will perform source code management functions, including documentation of procedures and consultation for SAS system developers working with various minicomputers. Applicants must have 1-2 years' data processing experience, with a working knowledge of PL/I and SAS software. Candidates should have experience with IBM under TSO or VMCMS, or one of the following systems: Digital VAX under VMS, DG MV under AOS/NS, or One to two years' VMS experience is desirable. A BS degree in computer science or equivalent is required.

Minicomputer Programmer will develop the SAS System for various minicomputers. The individual will write and maintain code and documentation, transport code, prepare master tapes, and educate users. A BS degree, preferably in computer science, and PLI knowledge are required. Minicomputer experience, knowledge of SAS software, and Assembler language experience are preferred.

DG Minicomputer Programmer will be responsible for developing the SAS System for the Data General ECLIPSE. Responsibilities include writing and maintaining machine-dependent code, reviewing documentation, transporting code from the VAX to the ECLIPSE, and assisting in educating users. Applicants must have knowledge of PL/I and a BS degree, preferably in computer science. Experience with Data General minicomputers, knowledge of SAS software, and Assembler language experience is preferred.

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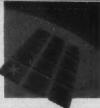
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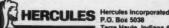
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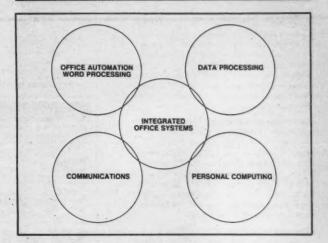


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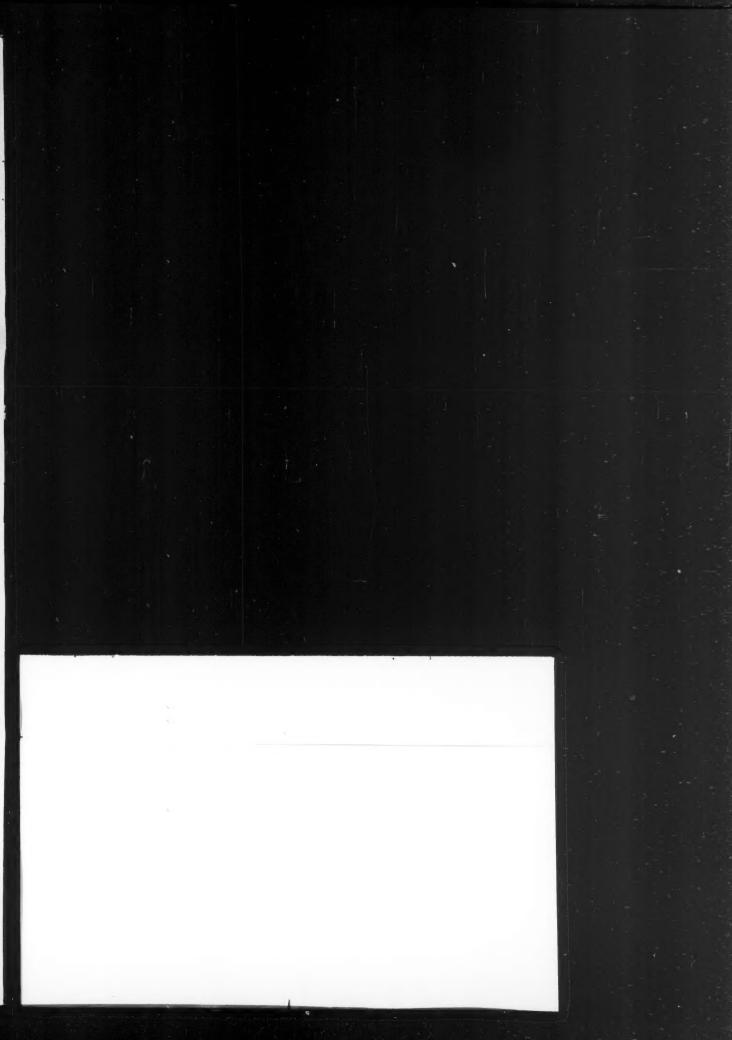
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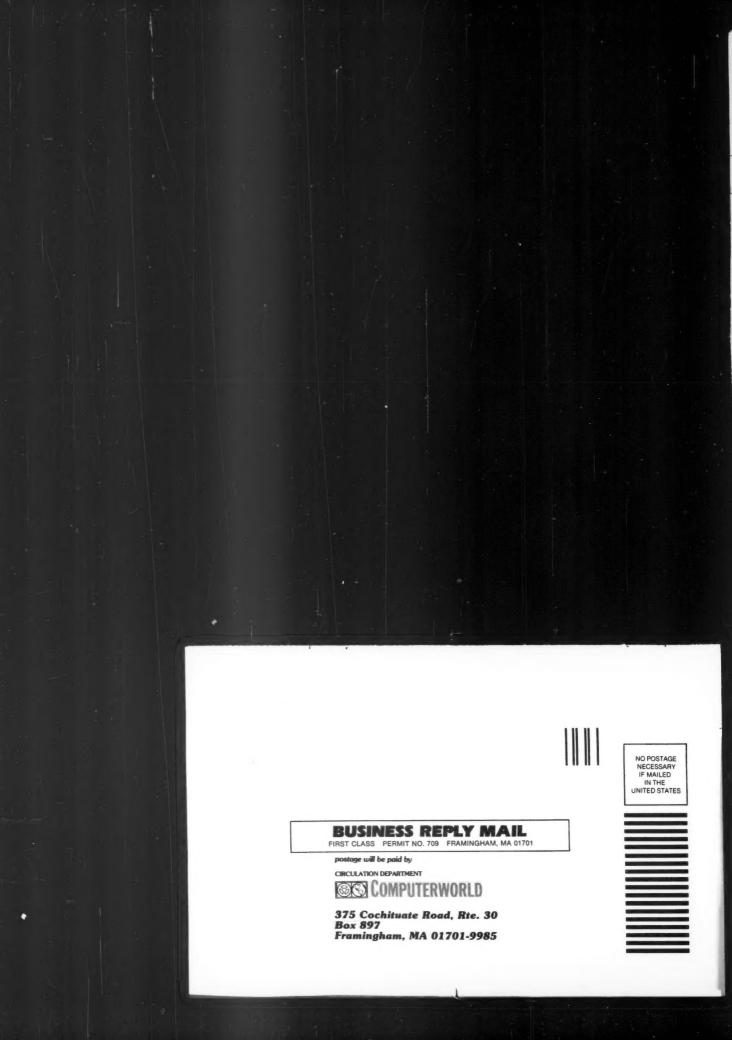
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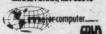
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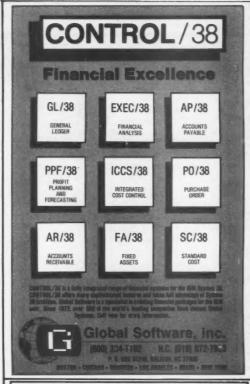
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ADR	
American Telophone & Telegraph	89-91
American Telephone & Telegraph Info Systems	54-85
Applied Seftware A.S.T. Besearch	23
A.S.T. Research	ID/18
AVATAR Technologies	64
B I Moyle & Associates, Inc.	10
John Reall	98
Bock Manufacturing	
BGS Systems, Inc.	
Boole & Babbage	95
Classes	
Classic	40-41
Collier Jackson, Inc.	10
Comdata	
Com/Peripherals, Inc.	29
Computer Distributors	96-97
Computer Power Systems	45
Context MBA	44
Corona Data Systems	TD /7
C8 Computer Systems	49
Callinet	18
CW Asla	
CW Micro	
CW Supplement	78
Dataproducts11,1	3.17.43
DBC/TPG	00.07
DEI-Telegroducts.	99
Deltak, Inc.	TTD /A
Digital Controls Corp.	TTD /G
Dorles Products	TD /14
Dyean Products	· TD/ 10
D/ 3	
Hastman Kodak Co.	80
Equitable Life Leasing	
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	48-49
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Information Science, Inc.	
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Integrated Business Computers	E1
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Interface	LD/0
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Johnson Systems	81
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licrodata	78.
licro Focus	
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15A	
TI Systems Corp.	11,18,
ational Semi Conductor	
CR Corp.	
ew Generation Software	
orthern Telecom	74
- Line Software	87
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AS Institute	
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ignal Technology Inc.	
MC Software Systems	***************************************
oftware Assistance	
oftware Automation	***************************************
oftware Express	***************************************
oftware International	32
oftware Results	***************************************
oftware Technology	
ретту Согр	
tartek	
Itone Mountain Computing	
yncoort	
Candem Computers	96
ektronix, Inc.	
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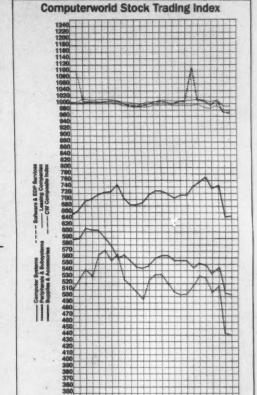
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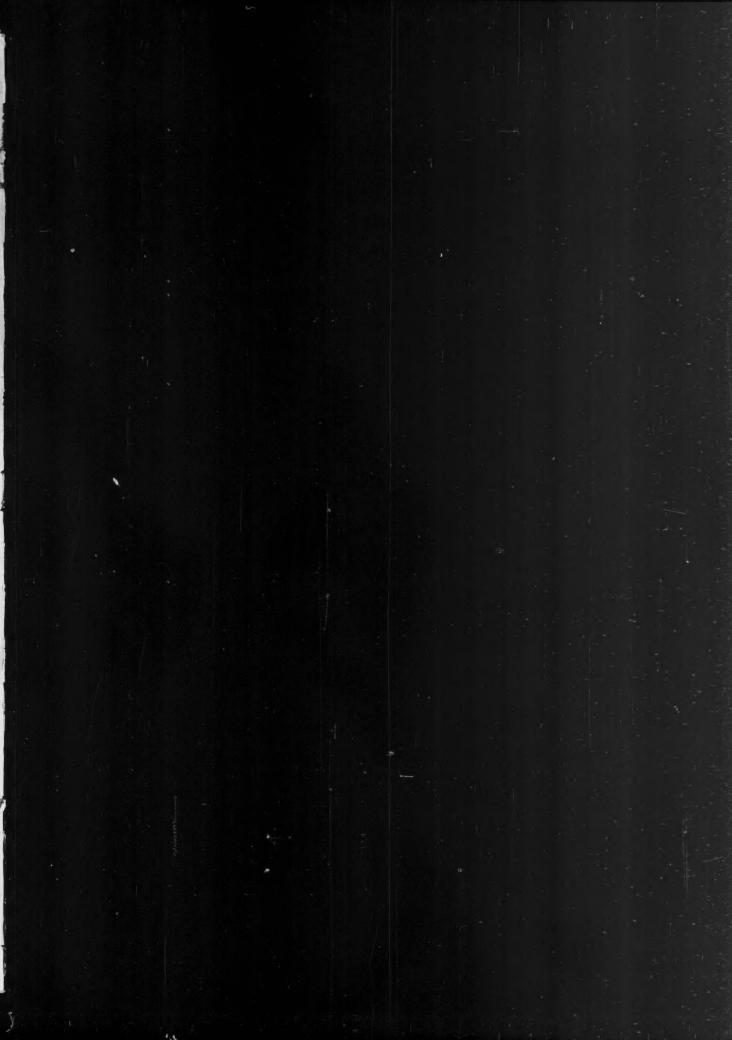
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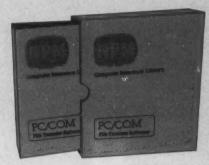


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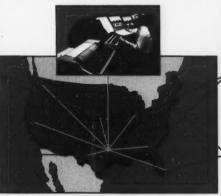
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# CONTENTS

About the Guide	4
Editor's Note	6
Magazine	7
Vendor Profiles	V-1
LISTINGS	
Modems	A-1
Multiplexers	A-62
Converters/Emulators	B-1
<b>Communications Processors</b>	B-22
Switching Equipment	B-42
Local-Area Networks	C-1
Software	C-14
<b>Facsimile Devices</b>	C-44
<b>Transmission Services Vendors</b>	C-49
Advertiser's Index	C-56

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# About the Guide

The Computerworld Buyer's Guide to Communications is a reference manual containing concise descriptions of communications hardware, software and transmission services and short profiles of the vendors offering those products.

The guide contains three major product sections, each preceded by a fold-out tab divider identifying the products listed within that section. The three tab dividers are: Modems and Multiplexers (Section A): Converters/Emulators, Communications Processors and Switching Equipment (Section B); and Local-Area Networks, Communications Software, Facsimile Devices and Transmission Services Vendors (Section

In cases where several different types of products are contained within one tab section, a gray-colored page with a product classification identifier is inserted in front of the listings for that particular product grouping.

Preceding the product listings is a vendor profile unit (Section V).

The front of the guide features a special magazine containing articles concerning the state of the industry, technology overviews of specific products and issues pertaining to communications.

Also featured in the guide are separate indices which provide a method for quickly locating the diverse products listed in the guide.

#### PRODUCT LISTINGS

The product listings contain pertinent technical specifications for the products listed in the guide. Technical data includes information on transmission characteristics, interfaces, protocols and compatability with other vendor's products, among others.

In general the listings are arranged in alphabetical order by vendor, with product descriptions following in alphabetical order by device name and/or model number. In some cases, all listings for one type of product — such as short-haul modems — are listed under the entry for a particular vendor, followed by listings for other classifications — long-haul modems - offered by the same vendor within the same general product classification .

All product listings include information on purchase terms, pricing, installation statistics and monthly maintenance fees when vendors supplied such data.

An example of a typical product listing is shown at right.

Note: Due to problems related to divestiture, AT&T Information Systems, Inc. was unable to provide us with information regarding their modem and multiplexer products. However, they are listed in the vendor section of the guide.

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Switchable Data Rates Distribution Method: End user. OEM, Third-party Price: \$700 **Number Installed to Date: Under** Date First Installed: November 1981

(See Vendor Profile Page V-7)

# About the Guide

#### COMPANY PROFILES

The company profile section of the *Computerworld Buyer's Guide to Communications* contains each vendor's address and telephone number as well as a listing of key management, marketing and technical personnel within the firm. In addition, the profile includes the company's target markets and revenues, among other details.

An example of a typical entry is shown at right.

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 COMMUNECATIONS, INC.
 330 Stovall
 Ining. TX 75061
 (214) 986-1151
 Camputer and Communications
 Equipment Manufacturing, Desler/
 Distributor
 Target Applications: Data
 Communications, Network Control;
 Data Collection
 Het Sales: \$1 Million - \$5 Million
 (1981)
 Contacts:
 Read of Marketing: Kenneth Brown
 Geographic Coverage: National
 Vace Established: 1986

ber of Employees: 30

#### INDEXING SYSTEM

Each product category (except transmission services) contains an index, which is located prior to the complete product listings for a particular product type. The introduction to each index provides a definition of the product category. It also explains the method used to sort the products for indexing as well as a description (when necessary) of the order the listings appear in the section.

The indices are designed to provide an overview of the products contained in that section and to make it easier to locate a specific product.

An example of an index is shown below.

# Fiber-Optic Multiplexers

VENDOR	MODEL	PRICE	PAGE
Belden Corp.	BIT-DRIVER 222-006	\$1,950	. A-69
Canoga Data Systems	CMX-320	\$2,500	. A-70
	CMX-808	\$1,200	. A-70
`	CMX-816	\$2.750	A-70

#### THE ENTERPRISE FILE

The Enterprise File is a data base containing information on thousands of companies that produce or provide computer-related products and services. It is the source of listing information in the *Computerworld Buyer's Guide to Communications*.

The project was started in April, 1982 and is a complement to the International Data Corp. (IDC) Data File, a well-known data base of end-user facilities.

Information is gathered and regularly updated by IDC through printed questionnaires and telephone surveys. To date the Enterprise File has records on more than 12,000 companies and 30,000 products.

Note: Vendors were offered the option of placing their company name in a larger typeface than the standard listing size. Vendors were also offered the option of adding a boxed insert at the end of their listing. These options were paid for by the vendor and should in no way be construed as an endorsement of these companies and products by the publisher of the Computerworld Buyer's Guide to Communications.

# Editor's Note

If you find uncertainty exciting then you'll love today's communications environment.

By now, most information processing managers have experienced the joys of mainframe mips watching, debated distributed processing ad nauseam and defended themselves against the encroachment of micros and their accompanying handmaiden - office automation.

And just when they thought it was safe to come out of the computer room, the communications dilemma lumbered onto the scene. And unfortunately, the dilemma is here to stay for the foreseeable future.

In some ways, the communications environment can be compared to the office automation scene at the time when information processing managers were confronted by administrative managers who wanted a say in automating the office. Generally, the person who was in charge of buying the new electric typewriter — and later the stand-alone word processor - wanted a hand in orchestrating the proliferation of personal computers for professionals. By then, the information processing manager began realizing the personal computer was in fact end-user computing, a much-talked about but rarely implemented concept. But as data and the access to data, rather than clerical work, became issues, the information processing manager became more highly visible in the direction of the personal computer in the organization.

Likewise, the communications function was often left in the hands of the telecommunications manager, a person largely responsible for operating and purchasing the equipment for the voice communications side of the house. But when data transmission was at stake, the information processing manager had to take a more forceful role in determining what the burgeoning network would look like.

In these two instances, there have been organizational problems as information processing managers have had to assert themselves in the office automation and communications disciplines.

In addition to often becoming embroiled in organizational politics, information processing managers have had to begin selecting products for these disciplines, giving form to what once dwelled in the realm of nebulous concepts.

Making decisions on what the communications structure of the organization will look like is difficult because it requires tying together the myriad of automated equipment already in place. The investment is expensive - it is not just a matter of which personal computer to select. With technology changing like New England's weather and many products not yet on the market, the risk of making an inappropriate choice is high.

Moreover, standards — not highly relevant to other forms of information processing - are critical to the communications arena. Yet few standards have been promulgated. Also, there has been little product and market direction vet. as illustrated by the fact that the two industry leaders, AT&T and IBM, have barely dipped their toes in the communications ocean.

Despite this environment, information processing managers are being pressured to come up with a workable networking scheme. In selecting products and systems to create the networks, information processing managers are often approaching the task as they did when other products were in their early life cycle — paying a lot of attention to technology rather than applica-

On the conference circuit, participants eager to find out more about local-area networks are bombarded by information about topologies and access methods. These are certainly important considerations, but they are essentially technological issues and do not take the place of advice on how to proceed with such a network.

From reports circulating around the user community, it appears that some of those who are implementing advanced communications networks are taking what's available and piecing it together into a workable solution - perhaps not ideal, but workable. While this approach may not be ideal, it may be time for more managers to take the great leap forward. Morein Flumental

Marcia Blumenthal

Magazine



# Magazine C O N T E N T S

-12-

# The State Of the Net

By Nick Lombardo

The local-area network market is still in its early adolescence and the battle for technological supremacy rages on.

—28— On the Road With

**Bypass** 

By Walter Ulrich

Technologies that allow users alternatives to telephone line transmission are on the horizon. None are truly proven yet, but the future is rosy.

18-

### A LAN Grows in Manhattan

By Jim Bartimo

Chase Manhattan Bank is moving ahead with its local-area network. In selecting which net to install, Chase did not suffer from "analysis paralysis," opting to be a test site for Wang Laboratories, Inc.'s Wangnet.

23-

# Plan Your Network

By Sherry Geddes
Users are overly concerned
about the technology of localarea networks. Concentrating
on the applications the networks will serve is a better way
of viewing the network dilemma.

\_\_\_\_32-

#### Interview With Leonard Kleinrock

By Marcia Blumentbal

The communications environment is a jungle, with a lot of new animals roaming around. Kleinrock, a leading communications expert, sheds some light upon what to expect for the next few years.

Encryption: Securing the

**Fortress** 

By Laura Brown Schlafly

Users resist data encryption because they often think these devices are too expensive or difficult to install. But is the loss of data an acceptable alternative?

-40

#### Mixing It Up With Muxes

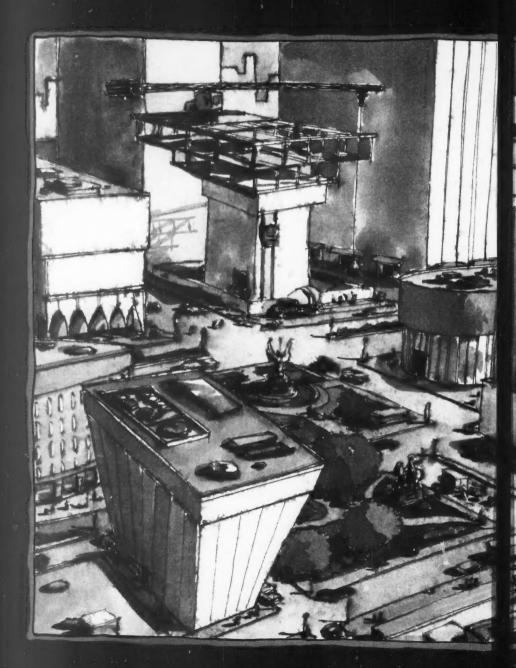
By James J. Michaels

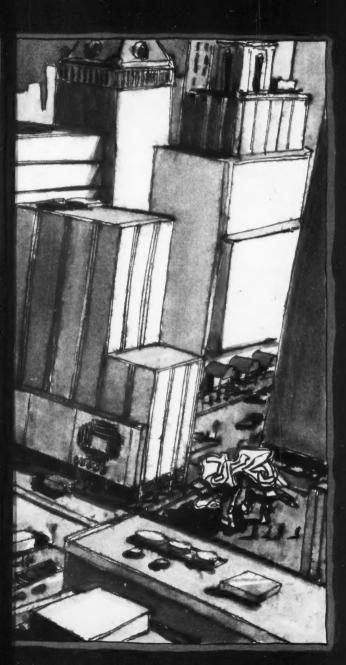
Multiplexers are quickly becoming a type of front-end processor. Specialized features such as multiple data links and switching are helping expand the range of these devices.

——45

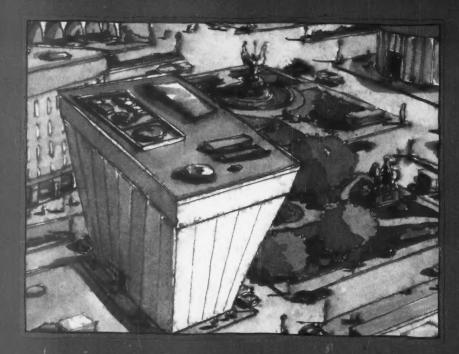
Controlling The Network

By Rudolf Strobl
Do you know the value of the network function in your hardware and software installation? In the not-too-distant future the network management component may approach 30% of the cost of your total system.





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# State of the Net

okall computer and data communications vendors active today have chosen to call at least one of their differings a local-area network. However, the consensus holds that the term refers quite specifically to one class of product. A local-area network is a system for the interconnection of two or more communicating devices that are:

Intracompany, privately owned, user administered and not other to nearly and the Feder.

al Communications Commission.

• Structured (Integrated Into a discrete physical entity with de-

vices connected by a continuous medium.

 Limited in geographic scope (within a distance not greater than 50 miles), with devices physically separated but not mobile.

 Able, at least potentially, to establish communications among any and all attached devices.

 High-speed, with data rates ranging from 500K to 50M bit/sec.
 Commercially available.

Only the simplest local-area networks are true turnkey products. Most require a great deal of on-site engineering to ensure the efficient location of stations, ease of reconfiguration and expansion, accessibility for testing and repair and compliance with building and fire codes. Some vendors provide "soup-to-nuts" configuration and installation services, while others require that the user purchase and contract for the installation of all but the intelligent components of the network.

When choosing a local-area network, the potential user faces four basic tehnical issues - the network's physical medium and transmission technique; its topology; its access method; and any higher level services it offers. Today's market offers three basic media, three topologies and three access methods. The issue of higher level services is more complex, since a vendor can offer such services above any practical combination of the other three factors. Right now, the availability of high-level services depends heavily on specific applications.

The three transmission media currently practical for local-area networking are twisted copper wire (twisted-pair), coaxial cable and fiber optics. Twisted-pair is the least costly of the three and the easiest to install, but it places severe limitations on the maximum distance spanned by the network and on the maximum data rate the network can support. Coaxial cable is the most versatile medium; it comes in two types that support different transmission techniques.

Baseband coaxial cable sup-

ports single-channel digital transmission. Only one signal can travel over baseband cable at a time. Broadband coaxial cable supports multichannel. radio-frequency (RF), analog transmission. Up to 30 different signals, each at a different frequency, can travel over a broadband cable at the same time. Baseband cable is slightly more expensive than broadband cable, and baseband networks are limited in length to a few thousand feet while broadband networks can span a few tens of miles. However, baseband cable is easy to install and requires almost no maintenance, while a broadband network requires physical design, and frequent professional maintenance.

There has been much controversy over the choice between baseband and broadband transmission, but actually the two techniques serve quite different applications. Baseband cable is most useful in small- to medium-size automated offices and in existing buildings where full-scale rewiring would be a problem. Broadband cable is best for large installations, especially campuses and industrial plants, which generate heavy data traffic and require a high level of immunity from electrical noise. A broadband data network can share a single cable with a cable video network or even with another broadband data network.

Optical fiber is the newest and currently the most expensive medium for local-area networking, however, its cost is expected to drop dramatically. Its chief advantages are security from tapping and total immunity to electrical noise. The difficulty of tapping a fiber-optic cable creates a problem in a local-area network environment, because the user requires a medium that is relatively easy to tap into in order to add stations to the network.

A network's topology is the physical and logical arrangement of its stations in relation to one another. There are three topologies in current use for local-area networks: the bus, or tree, in which

the stations are arranged in a straight and open-ended path along the main channel; the ring, in which the transmission path forms a closed circle through the stations with each station connecting directly to its two adjacent stations; and the star, in which each

sbop blindly will find localarea networking an inadequate, even restrictive, solution and will become tomorrow's dissatisfied customers.

station connects directly to a central switching element over a point-to-point link.

The bus is the most popular topology in the United States. The most common bus architectures are the Ethernet, developed by Xerox Corp. and supported by a large number of vendors; the Arcnet, a tree network developed by Datapoint Corp., and used under license by a growing number of vendors; and the broadband tree, used in all broadband cable networks. Ring networks are popular in Europe, since much early ring development occurred at European universities. Star networks, currently out of fashion for high-speed localarea communications, are beginning to make a come back. The hierarchical star, with a number of star-shaped subnetworks connected in a larger star configuration to a central switch, is being discussed in a growing number of research reports, and might become the mainstay of the next generation of local-area networks.

A network's access method is the technique by which the network distributes the right to transmit among its participating stations. On most local-area networks, all signals are broadcast on the main channel; only one signal can occupy the channel at a time, and no two stations can transmit simultaneously. The access

#### Baseband Local-Area Networks

Dase	EDANG LUCAI-A	rea Hetworks		
VENDOR AND MODEL	Datapoint Corp. ARC Local	Digital Equipment Corp. Decnet/Ethernet	Nestar Systems, Inc. Plan Systems	
GENERAL CHARACTERISTICS Principal Applications supported	General DP; office automation	General DP; office automation	General DP; office automation; lab/classroom instruction	
Voice and/or video applications supported	None	None	None	
Specific end-user data processing equipment currently supported	Datapoint business computers	Any DEC Unibus, Q-bus or CNS-bus system	Apple if, III and iBM PC families; plug-compatibles	
Topology Primary network medium Drop connection medium	Bus/star RG-62A/B4 RG-62A/B4	Tree Ethernet coax. 4-pair twisted wire	Unconstrained tree RG-62 coax. RG-62 coax.	
NETWORK DIMENSIONS Max dist between farthest net, attach, units Max dist between adjacent net, attach, units Max no, of end-user devices addressable	4 miles 2000 ft. 255	4.5 miles 4.5 miles 1,024	4 miles 4 miles 255	
TRANSMISSION SPECIFICATIONS Maximum throughput on main data channel Maximum end-user transmission rate Channel access method	2.5M bps 2.5M bps Token passing	10M bps 10M bps CSMA/CD	2.5M bps 2.5M bps Token passing	
HIGH-LEVEL SERVICES SUPPORTED Protocol conversion capabilities supported	None	Decnet/SNA; Decnet/X.25	Ascli/BSC; Ascli/SDLC	
INSTALLATION/PRICING Number of network attach, currently installed Avg price per end-user device connected	Over 51,000 \$7,000	N/A \$3,900	Approx 6,000 \$595	

method is the network's way of controlling traffic.

In general, access control can be either central or distributed. Most bus, tree and ring local networks use distributed access methods in which each station participates in the control of the network. There are two classes of distributed access methods: random (or contention) and deterministic. In a random-access method, any station can transmit at any time. In a deterministic access method, each station must wait its turn to transmit. Random-access methods work best under sporadic, quick-burst traffic and in situations in which some stations transmit much more data than others. Deterministic access methods work best under a steady. heavy traffic load.

The most common random-access method is carrier-sense multiple access (CSMA), a technique in which each station can sense when the channel is busy, and can refrain from transmitting until the channel is clear. In "pure" CSMA, two stations can sense a clear channel simultaneously and transmit signals that will interfere with one another. This is called a "collision." In a refinement of CSMA, CSMA with collision detection (CSMA/CD), stations can detect such collisions and have a way to arbitrate the use of the channel after a collision has occurred.

The most common deterministic access method is token passing. a form of distributed polling in which the stations circulate a special bit pattern, the "token," which confers permission to transmit on the station that receives it. The stations are arranged in a logical order and each station polls the next station by passing the token to it. Collisions are impossible, but each station, once it has passed the token, must wait to transmit until the token has circulated among all other stations on the network. Token passing is used most frequently in ring topologies, but it also works well in some bus and tree configurations.

Most star networks use either a central polling technique or telephone-style circuit switching. Some of the experimental hierarchical stars use variations of CSMA and token passing, while others use new, traffic-sensitive, hybrid access methods.

Higher level services are only beginning to become available for local-area networks. The service offered most frequently is protocol conversion, especially from asynchronous devices into one of the IBM synchronous protocols. Binary Synchronous Control (BSC) or Synchronous Data Link Control (SDLC). Some networks offer data encryption and many offer network management features such as statistical traffic reporting and error logging. Local-area networks marketed especially for personal computers can often convert disk files among formats for the most popular machines.

#### Baseband Local-Area Networks

Network Systems Corp. Hyperchannel	Orchid Technology, Inc. PC Net	Ungermann-Bass, Inc. Net/One	Xerox Corp. Xerox 8000 Network
Computer-to-computer data channel extension	General-purpose	General-purpose	Office automation
None	None	None	None
Mainframes, minicomputers and peripheral devices from a number of vendors	IBM PC, XT; PC-compatible peripheral devices	Any RS-232C, IEEE 488, DEC DR11, or IBM PC- compatible devices; 8-, 16- or 32-bit parallel dev.	Xerox 8000-based office automation products
Bus 75 ohm coax. 15 ohm coax.	Uneer bus RG-59B/U; RG-11/U; CATV RG-5B/U or RG-11/U coax.	Linear bus Ethernet coax.; fiber-optic Transceiver cable	Bus Ethernet coax. 4-pair twisted wire
1.9 miles 1.9 miles Unlimited	1.3 miles 1.3 miles 65,536	1.5 miles 1.5 miles 24,567	1.5 miles 1.5 miles 1,024
50M bps 40M bps CSMA/CD	1M bps 1M bps CSMA/CD	10M bps 1.3M bps CSMA/CD	10M bps 10M bps CSMA/CD
None	None	None	Xerox/IBM 3270; Xerox/Ascii
Over 2,000 \$500-\$40,000	N/A \$695	Over 2,900 \$500	Approx 20,000 Subject to bid pricing/ quantity

Chart Couriesy of Datapro Research Corp

The number of technologies available, and the number of practical combinations of those technologies create both opportunity and confusion. The opportunity comes to the sophisticated purchaser who can pick carefully from the range of options to create a specific network for specific needs, and to the high-tech entrepreneur who can design and market an unorthodox but demonstrably better way to solve the problems of networking. The confusion comes from the lack of compatibility among different com-mercial networks, both with one another and with the end-user equipment that must communicate over the network.

The local-area network industry has seen two major efforts to establish standards: one by industry organizations attempting to legislate standards, and one by vendors attempting to establish standards in the marketplace. Committee 802 of the Institute of Electrical and

Electronics Engineers (IEEE) has led the legislative effort, while Xerox and the other Ethernet vendors have spearheaded the most successful market effort. Datapoint and its licensed chip manufacturer, Standard Microsystems, Inc., have also succeeded somewhat in establishing a de facto standard. Should IBM announce its much-rumored local-area network, it would likely become another market standard.

Although the IEEE 802 committee has not established a single standard, it has published draft specifications for at least two, a CSMA/CD architecture similar to Ethernet and a token-passing bus. The committee intends to issue at least one more draft standard, for a token-passing ring network, and a number of vendors are petitioning the committee to standardize their architectures for specific applica-Apparently local-area networking is a technology too young for standards.

Right now, the local-area net-

work market contains three major segments: baseband networks, broadband networks and networks especially for personal computers. Among the baseband vendors, the Ethernet community - vendors such as Xerox, Digital Equipment Corp., Ungermann-Bass, Inc. and Interlan, Inc. - still leads the pack. However, Datapoint's installed base of Arcnet token-passing networks is still growing. Othnon-Ethernet baseband architectures are beginning to disappear. Zilog, Inc., for example, has dropped its Z-Net II product in favor of Ethernet compatibility.

The broadband market remains a three-way race among Interactive Systems/3M, Sytek, Inc. and Ungermann-Bass, each of which have approximately the same market share. Wang Laboratories, Inc.'s Wangnet is beginning to compete with the market leaders, but potential customers still see it as a network only for Wang systems. Other notable broadband vendors are

#### **Broadband Local-Area Networks**

VENDOR AND MODEL	Interactive Systems/3M Videodata LAN/1	Sytek, Inc. LocalNet	Ungermann-Bass Net/One	Wang Laboratories WangNet
GENERAL CHARACTERISTICS				
Principal applications supported	General DP; office automation	General-purpose	General-purpose	General DP; office automation
Voice and/or video applications supported	Analog voice; full-motion video	Voice; video	Can coexist	7 video channels
Specific end-user data processing equipment currently supported	Any async RS-232C device	Any RS-232C device	Any RS-232C, IEEE 488, DEC DR11, or IBM PC-compatible device; 8-, 16- and 32-bit parallel devices	All RS-232C and RS-449 devices; personal computers; mainframes minicomputers; peripherals
Topology	Tree-like bus	Tree	Rooted tree	Dual-cable tree
Primary network medium	CATV cable	CATV cable	CATV cable	Dual CATV cable
BROADBAND CHARACTERISTICS				
Cable configuration	Single or dual	Single	Single or dual	Dual
Number of channel pairs available	450	120	5	360
NETWORK DIMENSIONS			,	
Max dist between farthest net. attach. units	14 miles	50 miles	20 miles	8 miles
Max dist between adjacent net. attach, units	7 miles	150 ft.	20 miles	8 miles
Max no. of end-user devices addressable	11,000	24,000	7,200 per channel	Over 20,000
TRANSMISSION SPECIFICATIONS				
Maximum throughput on main data channel	2.5M bps/channel	128K bps or 2M bps	5M bps	10M bps
Maximum end-user transmission rate	100K bps	19.2K bps	1.3M bps	9.5M bps
Channel access method	Token passing; dedicated channel	CSMA/CD	CSMA	CSMA/CD; poll select; dedicated channel
HIGH-LEVEL SERVICES SUPPORTED				
Protocol conversion capabilities supported	None	Ascii/BSC; Ascii/HDLC	None	Ascii/BSC/SDLC/ Wascii
INSTALLATION/PRICING				
Number of networks currently installed	350 (3LAN/1 token systems)	350	Over 20	30
Avg. price per end-user device connected	\$350 (with 8 port NIU)	\$475-\$575	\$590	Varies

Chart Coursey of Detapro Research Corp.

Contel Information Systems, Inc. and Concord Data Systems, Inc.

The market for personal computer-based local-area networks is the fastest growing segment of the industry. Corvus Systems, Inc.'s Omninet and Nestar Systems, Inc.'s Plan networks lead the field now, although the potential market is so broad that any of a dozen competitors could catch up quickly. In the submarket that specializes in networking for the IBM Personal Computer, Orchid Technologies, Inc.'s PC-Net is an early leader.

With all the current activity in both the technology and the marketplace, some constants remain. The user must decide among a large and often confusing array of products both within the local-area network market and among alter-native technologies. Users who examine the market with open eyes and detailed and careful assessments of their needs will acquire a powerful tool for the integration of a wide range of automated functions. Users who shop blindly will find local-area networking an inadequate, even restrictive solution and will become tomorrow's dissatisfied customers.

Alongside the many applications for which local-area networks can provide beneficial, cost-saving solutions are some applications for which local-area networks are either too costly or too unsophisticated technically. In other words, for some applications that might lend themselves to local-area networking, other technologies can do the job better.

For simple port selection or port contention among one or more computers and a network of terminals, a local-area network is simple overkill. Users in such situations usually wish only to gain access to host-resident applications: the host computers handle requests for storage and peripheral services. The terminals are usually unintelligent, asynchronous devices that cannot share software either with the host or with one anand that need to communicate with only one computer at a time.

For port selection among a small number of computers of sim-

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1. BUSINESS/INDUSTRY (Circle One)

10 Manufacturer (other than computer)

Types of equipment with which you are personally involved either as user, vendor or consultant

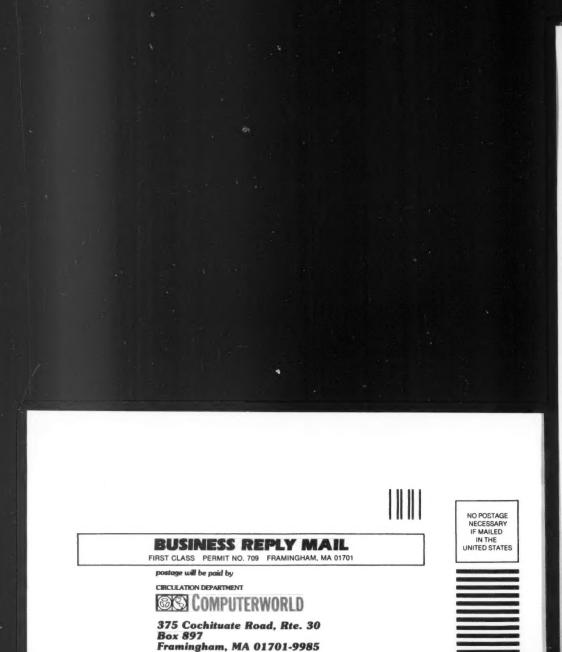
Mainframes/Superminis
 Minicomputers/Small Business Computers

C. Microcomputers/Desktops D. Communications Systems E. Office Automation Systems

20 Finance/Insurance/Real Estate

End Users





ilar make and with similar operating systems, one or more shared front-end processors can do the job more efficiently than a localarea network. For port selection among mutually incompatible computers, a port selection switch (also called a data PBX) is the best choice. Both front-end processors and data switches have been on the scene for years; they offer all the benefits of proven technologies: stable interfaces, time-tested maintenance and control procedures and a history of satisfied customers. Users should not take risks with an infant technology for simple applications when a less risky alternative is available.

At the other end of the spectrum lies the large-scale, fully integrated voice and data network. The local-area network has not been built that can handle a full load of voice telephone traffic along with a full load of data. Local-area networks are a creation of the data processing industry, and their technology has bypassed, not solved, the problems of voice communications that

the telephone industry has been handling for decades.

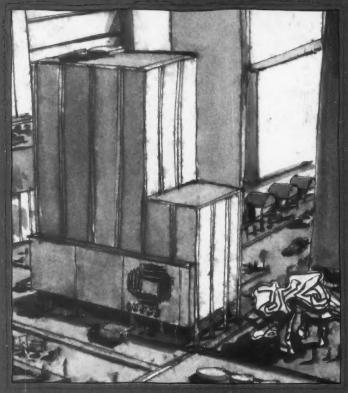
From the telephone industry comes the voice/data PBX, a circuit switch built on a digital matrix and designed to handle both voice and data traffic. For data handling, these switches represent an even younger technology than localarea networking, and their data transmission capabilities are currently quite narrow. They use twisted-pair wiring, usually the same wiring as the building's telephone system, and are limited to a 56K or 64K bit/sec data rate. They are useful only in large installations, with a minimum of a few hundred lines. Their switching algorithms are designed for voice traffic (for a large number of short calls), rather than for the long sessions common with data traffic.

Still, they offer a number of advantages for large offices in which management would like to place a terminal on every desk. Any large office must have a telephone network, and the cost savings from having data applications share the

voice network rather than using a separate cable plant can more than make up for the high initial cost of a voice/data PBX. The big switches' present limitations for data handling are not a long-term issue; their makers will probably have ironed the bugs out of da'a switching long before current local-area network vendors have taught their products to switch voice calls.

Current leaders in the voice/data PBX market are Rolm Corp., now partly owned by IBM; Northern Telecom, Inc., long a supplier to the Canadian telephone system; AT&T Information Systems, Inc., the former American Bell, Inc.; InteCom, Inc., whose IBX systems include an Ethernet interface; and Nippon Electric Corp. New vendors expected to do well are Ztel and CXC, both of whose switches incorporate local-area network technology.

Lombardo is an associate editor of Datapro Reports On Data Communications at Datapro Research Corp. in Delran, New Jersey.



# A LAN Grows In Manhattan

By Jim Bartimo

Local area networking, much like the weather, is something about which people are always talking but never doing anything — except at Chase Manhattan Bank.

Located in the heart of New York City the bank's operations and corporate man agement information systems (MIS) de partments have forged the beginnings of a top-to-bottom network with the installa llation of a broadband local-area network.

The network ties together four buildings in midtown New York and a fifth building approximately one mile away. Eventually, the local network will encompass one of the bank's Long Island offices some 15 miles away, probably through microwave transmission. The local-area network itself will connect 60 to 90 floors in nine buildings in the next few years.

With further expansion, the local network will tie into the bank's private packet-switched network for national and international access to the bank's 90-plus data centers. According to Harvey S. Hershkowitz, a vice-president in the operations department, who helped usher the network into existence, "People wanted one terminal that could access any host."

Deciding on what type of network to use is perhaps the biggest deterrent to most companies suffering from "analysis paralysis," but Chase was given a virtually risk-free opportunity to decide on the type of network it would use.

"We were Wang's [Laboratories, Inc.] second largest commercial customer," Hershkowitz explained. So, in late 1981, Chase agreed to become a beta test site for the newly developed Wangnet local-area network. "If it didn't work, we wouldn't buy the equipment," he said.

What is somewhat surprising about Chase's early entrance into local-area networking is the bank's size. It is the third largest commercial bank in the U.S. controlling more than \$80 billion in assets. With more than 300 branches, it employs 36,000 people and extends its financial services to 100 locations worldwide. Despite what could have been a bureaucratic maze of committees in smaller organizations, Chase moved decisively into networking.

In fact, Chase was so certain that it needed some type of local network that it began laying broadband cables before Wangnet was selected. The bank knew that no matter what type of network it chose, the cable under the New York streets could be used. "We thought we should get as much bandwidth as possible for expansion, so we went with broadband cable." Hershkowitz said.

Wangnet (renamed Chase Cablenet internally) is a broadband local-area network using carriersense multiple access with collision detect (CSMA/CD). Its wide bandwidth ensured Chase easy expansion into voice, image and video, Hershkowitz said, and transmits data at 10M bit/sec.

How did Chase know it was time for a local-area network? To start with, there was a growth rate of 500 terminals per year just for Wang equipment and a total of more than 5,000 terminals already installed throughout the company. There already were multiple overlapping networks in place and Chase was spending approximately two million dollars each year just to install and move terminals within its buildings.

While no feasibility study was performed for Wangnet specifically, studies on networking already had been done which concluded that a single network was needed to replace the existing "spaghetti" network and support high-capacity transmission for a variety of traffic types. Because reducing the amount of cable in use was also a goal, the bank spent a considerable amount of time (as much as 60% to 70% of the total job) preparing space for cable runs.

Because Chase was a beta test site, "there were fewer meetings and fewer people involved than there normally would be in this case," explained Hershkowitz. "It would have taken longer if we had sent out a request for bids. It could have taken six months to a year." While being a test site had its advantages, there were unforeseeable problems with Wang in delivering the equipment throughout much of 1982. "The equipment came in very slowly," Hershkowitz said, "It took Wang longer than it should have."

With a plethora of terminals, networks and cables involved, "this had to be approved by senior management," according to another vice-president in operations and corporate systems, Ronald E. West. "We're due to report back to senior management in six months. Before we can expand to other buildings, we have to show that we're serving the bank's business needs and not our own interests in technology."

After senior management approval for a local network was secured, cable laid and a network selected, Chase began the job of implementation on a limited basis. "People were doing file transfer, inquiry and other applications," Hershkowitz said.

By the time the local network became operational last year, technocrats such as Hershkowitz and West had primed users with what they called "a marketing job."

"We asked people to volunteer to participate in the beta test. We looked for technical people who could handle it. Programmers were used at first and it spread to the end users," according to the shad installed a dual broadband facility into its first four buildings, connecting riser cables to the trunking system in three of the buildings.

Chase Cablenet offers four service categories: private and dial-up line-equivalent services, Wangband, a peripheral band and a utility band.

• The private and dial-up equivalent offers up to 9,600 bit/sec transmission over point-to-point or multipoint, half-duplex or full-duplex, asynchronous or synchronous media through an RS-232, V.24 interface. With an RS-449 or V.25 interface, up to 64K bit/sec transmission speeds are achieved.

 Wangband offers a 10M bit/ sec contention service for nine Wang VS, OIS and Alliance minicomputers. Two IBM 4300's and a handful of Wang and IBM personal computers also reside on Wangband

- The peripheral band offers a multiplexing scheme which allows some 33 Wang products to be coupled to a host instead of hardwired.
- The utility band offers up to seven video channels for teleconferencing or text and news dissemination, but teleconferencing is still in the testing phases with two rooms in use.

While the local area network is up and running, Hershkowitz warns that a network is not the answer to all communications problems. "The ... [local-area network] does one thing for you," he said, "it allows IBM, DEC [Digital Equipment Corp.] and other equipment to connect but you still have to program the machines to talk to each other. Otherwise, it's like calling France on your telephone — you have a connection but you still can't speak the language."

The networking cost so far is estimated at a reasonable \$500,000 by West, who expects several million dollars will be spent for future development. "We have a five-year goal of recovering all money," West said. It will include a chargeback system to all users.

Maintenance costs will also be cut as Chase lessens its reliability on Wang for service by using inhouse personnel.

With one of the first local-area networks in place, does Chase feel any buyer's remorse? After all, some industry pundits are touting the next generation of nonblocking private branch exchanges (PBX) as the preferred means of data networking and integrating voice and data.

"We have no regrets because we have a system that's up and running, and that's more than most people can say," Hershkowitz said. "We're looking at a new PBX, but it will coexist with Wangnet. Wangnet traffic is 10 megabits [per second] — no PBX can equal that speed."

West agreed. "We have a hybrid approach — we're not discounting PBX's," he explained. "We have vendors coming in with PBXs now." Chase scruntinizes a vendor's technology, its ability to support Chase Cablenet and voice and data integration. "When a vendor tries to sell only its own hardware, we tell then we want a system solution to our business problems," West said.

Chase is now using a AT&T's Centrex and with the January 1 divestiture of the phone company, "we'll be looking very closely at PBXs with the introduction of the new access charge," Hershkowitz said. Divestiture and voice/data integration have tossed monkey wrenches into many voice departments that were often running smoother than the data processing departments. "The voice people

are a little worried about losing their customers to the data people," Hershkowitz said.

As West said, "We're forced to talk to the voice people now. There's always wars between voice and data."

But despite the wars, West anticipates electronic and voice mail capabilities on a PBX by 1985 or 1987. "We will certainly have downtown wired up," he said. "We want to come off the PBX and broadband cable and gateway to packet switching." It will be ihrough advanced gateways that Chase will most likely provide its national and international networks to its 90 plus data centers.

For medium-range voice and data communications, Hershkowitz expressed an interest in microwave links, but West said, "we're looking at other types of bypass technologies also."

So what actually began as a strategic telecommunications plan for Chase in 1979 has developed into a fully functional local-area network and the start of an integrated voice/data network that most users and vendors only talk about. "We've decided the local-area network works," Hershkowitz said. "We're into the expansion phase now." o

Jim Bartimo is senior writer for Infoworld, a newsweekly based in Menlo Park, Calif.



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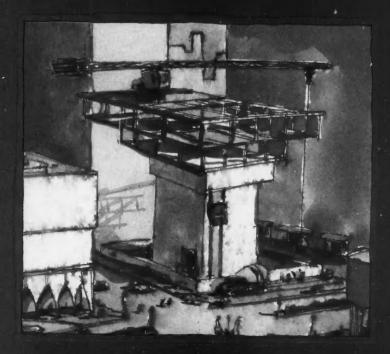
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# Plan Your Network

By Sherry Geddes.

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Almost unnoticed amidst the word technical Controverse over local area activable is a growing perception is the user community that local area networks are fundamentally. The high technishing slow too binding together has computers, to canada, prolifera-

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looking for a means of controlling access to data bases and ways to perform file management.

Viewing a local-area network as a tool for connecting diverse communciations equipment, rather than as a separate product, helps to put technological issues into perspective. Taking a top-down, applications-oriented approach can resolve the technological choices required in selecting the appropriate local network. From this stance, the technical choices are driven by the usage objectives. If, for example, the bulk of the usage is high-speed file transfers between two different hosts, then a point-to-point baseband system would be a good choice. Conversely, if the objective is to share expensive resources throughout a widely dispersed geographical area, point-to-point technology plainly will not work because the installation becomes a wiring zoo.

Users should also consider the usage needed when selecting the medium. If video is not necessary, then broadband technology is not necessary, or if geographic scope is necessary, then a baseband system will not be appropriate.

Because of the relative newness of local-area networks, the technological mire is really an issue of more concern to the vendor than it is to the user. Like other products on the market, users must begin to approach vendors of local-area networks with solutions in mind. Most local-area network vendors have different approaches to a network and by taking the solution approach, the user narrows the choices considerably. It is necessary for the vendor to describe what the local-area network will do for the organization.

Organizational considerations play a key role in determining user objectives. The study revealed distinct differences in personality, age, experience and systems-orientation among proponents of different technologies. These differences significantly impacted the network selection process.

Younger managers tend to be

systems-oriented. They take a broad view in approaching the local network; therefore broadband-based systems appear to be more popular with these managers. On the other hand, older managers in industrial environments are not comfortable with a systems orientation and tend to select baseband systems. The selection process then seems to be significantly conditioned by managers' attitudes.

For example, several sites with a strong systems orientation did not even consider alternative technologies (thought to be less than state-of-the-arr), although there was no immediate requirement for the more sophisticated approach.

Connection philosophies also were found to reflect organizational issues. Three distinct connection approaches were isolated:

- A classic integrated approach to local networks is one in which all devices are interfaced directly to a totally wired building. This would be preferred by users in Fortune 500 companies, high-technology companies, government- or education-related endeavors.
- A limited hierarchical approach is one in which the building wiring is used only for connections between a central host and intermediate devices controlling groups of terminals and related equipment. An example is a factory-type setting.
- A piecemeal approach, similar to the classic PBX, consists of a trunk or utility system linking major buildings or concentrations of DP activity with equipment connected primarily through twistedpair wire. Transaction-oriented systems are found in banking and insurance firms which have not yet integrated the technology into the total organization.

An organization that wants to incorporate a local-area network must further assess the usage the network will receive. In one case, a bank performed a traffic analysis for its proposed network. Once installed the bank experienced considerable degradation in its broadband network because there were

3,000 personal computers in the organization that had not been figured in the usage scheme. This was because the bank allowed micros to be purchased as office rather than computer equipment.

This problem is endemic in the industry. As soon as a local-area network is installed, equipment to hook into it comes out of the woodwork. Any user who does not figure on there being 30% more equipment than originally planned for is making a big mistake.

The decision to consider implementing a local-area network in an organization was often triggered by changes in the organization. Some of these changes included additions (such as an energy-management system or the installation of a new computer), construction of or a move into a new facility or anticipated expansions in programmable controllers or terminals. The initial consideration of the local-area network was emotional and not a product of careful planning and analysis. While the final decision to incorporate the local network is based on economics, the evaluation process tends to be emotional and confusing.

The archetypal decision-maker in this process was a manager confronted with the problems of supporting a large, growing installed base of devices, a number of host computers and frequent movement of devices with a need to avoid using masses of twisted-pair wire. And, if the manager who decides whether the organization will have a local-area network and what it will look like also initiates contact with the vendor, he is not generally a management information systems (MIS) manager. MIS is only starting to become involved with the issue of proliferating computer power. MIS generally figures heavily in the implementation process, but is often not the initiator.

Users found that local-area networks were a good means of alleviating the physical problems brought on by moves or additions to the installation. Recognizing the importance of planning for future



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#### TYPICAL PER-USER BROADBAND LOCAL-AREA NETWORK COST ANALYSIS<sup>1</sup>

COST	BROADBAND	BASEBAND
I. HARD COSTS		
Wire, cable and taps	\$ 233	\$525
Computer port contention <sup>2</sup>	0	80
Modems	827	0
Interconnectivity <sup>3</sup>	0	200
TOTALS	\$1,050	\$805
II. SOFT COSTS		
User relocation <sup>4</sup>	\$ 7	\$ 25
Interhost message processing <sup>5</sup>	0	625
Additions <sup>6</sup>	86	200
Maintenance <sup>7</sup>	90	0
TOTALS	\$183	\$850
III. HARD PLUS SOFT COSTS		
Hard costs	\$1,050	\$ 850
Soft costs	183	850
TOTALS	\$1,233	\$1,655

Net annual savings using broadband over baseband: \$422/user

#### FOOTNOTES

- 1 Costs based on figures supplied by three broadband and three baseband vendors for a hypothetical local-area network.
- <sup>2</sup> 25%-50% reduction in required number of host ports.
- <sup>3</sup> No patch panel or switch resources required.
- 4 Assumes 25% of employees are relocated each year.
- 5 5% of host processing resources.
- 6 10% growth annually.
- 7 Assumes spares kept on site.

Chart Courteey of Stretegic, Inc.

expansion and capabilities, most users surveyed opted for broadband, not baseband networks. Typical connection patterns included asynchronous terminals to asynchronous processors, bisynchronous remote-batch terminals to bisynchronous processors, various IBM 3270 configurations and highspeed host-to-host file transfers.

But the issue of cost justification has been a knotty problem for all users surveyed. Typically, localarea networks cannot be justified solely on the basis of hard-cost savings. Its cost-justification must be based on a combination of hard costs, soft costs (such as frequent movement of devices) and less easily quantified but very real considerations of user access to resources, enhanced productivity and lowered frustration levels. Local networks offer easy relocation of devices, high reliability, re-

duced media costs, flexibility, easy growth paths and additional services, which will be increasingly important in coming years.

Local-area networks provide for distributed processing, peer-to-peer communications, reduction of "information float" and, when the medium selected is broadband, video capabilities for conferences and training. The accompanying chart illustrates one technique for cost-justification of a broadband local-area network.

This analysis does not include further broadband local-area network savings derived from:

- Fewer expensive resources required.
- Labor savings from increased productivity.
- Savings due to extended computer life (postpones the necessity of upgrading to a larger host).
- Credit for ability to add video,

security and alarms and additional applications. Because the payoff period is typically short, no return on investment computations have been included.

Vendor independence emerged as a crucial concern. As is true with any innovation, the initial applications tend to be replacements for existing products and only after the new approach has been in use for awhile are its unique applications and advantages exploited, such as electronic filing. To commit to a proprietary technology for the local-area network this early in the communications explosion (before IBM and AT&T have even actively entered this market) locks the user into a network-attachable supplier's products. Until IBM and AT&T enter the fray, it is unlikely that any single vendor will be able to provide the optimal solution for current and future applications that will be interconnected through a local-area network.

Other concerns expressed by survey respondents included video capability, vendor stability, maturity of the technology (a big plus for broadband, which is essentially cable television technology), ruggedness, ease of expansion and flexibility and capacity.

As mentioned previously, product evaluation was strongly influenced by organizational factors and the far-sighted concern for video capability even when there were no immediate or short-term plans for implementing video. Interestingly enough, among the more than 50 sites surveyed, virtually none included word processing applications in the planning or decision-making phases, frequently resulting in sites with dedicated WP local-area networks not coordinated with nor able to communicate with the DP-based local-area network. Among leading end users, this parochial picture is changing as the emphasis shifts from local-area networks as a product to local-area networks as a protocol for facilitating communications.

Technical considerations among the existing installed base reflected the prevailing technical philosophy at the time the localarea network was installed. Thus in early installations point-to-point systems were the rule since stable. effective multipoint systems did not appear on the scene in quantity until 1980 and 1981. Subsequently, the majority of newer installations surveyed rejected point-to-point product offerings as passe regardless of suitability, based on either preferences for newer technology or understanding of the need to plan for unforeseen future requirements. They tended to want the latest technology whether it was appropriate or not.

For users who adopted local networks early, standards were not an issue. Their needs were sufficiently pressing and they could not afford to wait for standards to be developed. As is now abundantly

evident by the multiplicity of IEEE 802.X proposed standards, the industry is still at least a year away from having even viable subsets of a cohesive standard and five years from having real standards. Large users look to IBM to set the standard in the near future.

Security issues, largely a factor only among the government and military sector in the sites surveyed, are rapidly becoming a concern for leading end users as localarea network usage becomes widespread. Hard on the heels of security are the legal implications - such as how to prove that a document which only exists in paperless form has not been tampered with. Large users are now planning or implementing security devices external to the network and are not requiring the network to provide automatic security itself.

Product evaluation is being impacted by the shift in user perception. Now, not only are cost and technical merits major factors, but increasingly the expansionary and interface characteristics of products are examined to ensure present and future compatibility in multivendor environments. Those firms engaged in long-range planning are evaluating local-area network proposals with an eye toward future migration onto optical fiber and development of hierarchical structures. An example of this is a series of inexpensive, dedicated baseband networks serving individual domains tied to a broadband backbone network which is, in turn, connected to fiber-optic links for intercity transmission.

Technical innovations are occurring in the semiconductor field that will soon result in integral local-area network capability in the device itself rather than, as presently, in a stand-alone box between the device and the network. This change, combined with a trend toward totally wired buildings, will soon result in users plugging into the local-area network with any appropriate device in the same way as an appliance is plugged into household electricity

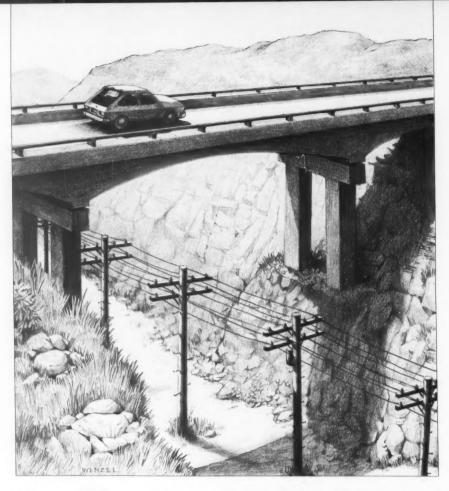
when and where needed. The local-area network will be as transparent as electricity is now and network products will be portions of boards resident in the hosts, controllers and other devices.

In terms of trends in the world to come beyond 1990 the communications scenario can be viewed in terms of the size of the business. Small firms will have an inexpensive analog PBX and virtually no data networking, since their requirements are to share time, not resources. The market is sufficiently fragmented and the cost of individual sales calls is prohibitively high so large communications vendors cannot afford to pursue this market. Handing diskettes around is a physically viable and cost-effective alternative to communications networking.

Medium-size firms will have an analog PBX plus an inexpensive baseband local-area network or will have an integrated voice/data PBX to handle their data networking. Large firms will have integrated voice/data PBXs to handle voice requirements and some data applications plus a broadband local-area network for bulk data, video and intracity networking, such as connecting the metropolitan branches of a bank. These local network-PBX systems will coexist and be connected by gateways for maximum communications efficiency. Additionally, they may be augmented by wireless systems such as cellular radio, particularly for campus-type environments.

Local-area networks and PBXs are the "super glue" of today's local communications systems. By providing connectivity virtually without regard for device type, brand or application, local-area networks and PBXs facilitate and enhance effective, timely communications.

Geddes is director of communication systems for Strategic, Inc., a San Jose, Calif-based publishing, research and consulting firm specializing in bigb-technology industries.



# On The Road With Bypass

The communication technologies which permit users to bypass traditional telephone company lines are emerging. Although many of these techniques are not yet commercially available or economical to use, they bold the promise of delivering a great deal of functionality at a reduced cost. Cellular mo-

By Walter Ulrich

bile radio, digital termination systems (DTS) and cable television are some of the latest developments in the bypass arena.

This year will undoubtedly witness the most fundamental changes in communications since the telephone was invented in 1876. Activity in the communications marketplace and the regulatory environment and new technology innovations are converging and these changes will tremendously alter the flexibility and cost of communications services.

Fifteen years ago, you could buy communication services from any company — as long as it was part of the Bell system. In 1969, the Federal Communications Commission (FCC) voted that a Texas businessman, named Carter, would be permitted to tap telephone lines using an accoustic coupler. On January 1 of this year AT&T gave up the Bell name and divested itself of its seven operating companies. "Today, the FCC's efforts at deregulation are nearly complete.

In addition to marketplace and regulatory change, there have been great advances in communication technologies. The concept of digital termination systems (DTS) was introduced in 1978; today they are becoming a reality. Cable TV has successfully penetrated many households in the U.S., but vendors are only beginning to offer two-way cable to businesses. The first cellular mobile radio system went into full operation last October. As satellites become more powerful, satellite-to-office communications becomes more feasible.

Communication managers have long complained that it is easier to transmit data 3,000 miles across the country than it is to move it from their office to the long-haul facility. Furthermore, the restructuring of the communications industry will mandate an increase in the cost of traditional local-loop services. Alternative local-loop communications, commonly referred to as bypass techniques because they bypass traditional local exchanges, offer solutions to the connection and cost problems. vices. Alternative local-loop communications, commonly referred to as bypass techniques because they bypass traditional local exchanges, offer solutions to the connection and cost problems.

The traditional telephone plant is just not capable of providing the speed, quantity and quality of communication services needed by today's information-heavy businesses. In some cities higher bandwidth communication services are either unavailable or have unacceptable lead times for instal-

lation. The reliability and quality of lines that are suitable for voice communications may be entirely unsatisfactory for handling data. In some cases, the time to repair older equipment and circuits can be a matter of weeks.

In past years almost no one could predict either their unit cost of communications or their total communications bill. Tariff charges from the Bell companies are not subject to negotiation and could not be predicted. The communications director, charged with managing corporate communication costs, could not control the most basic element of that cost—the price of communication ser-

vices. Bypass ends that worry. Alternate technologies allow communications managers to negotiate communication costs and establish prices for years to come. Furthermore, the communications department can make capital investments in some forms of communications technologies that will allow them to fix the costs of bypassing certain local exchange services. The ability to control communication costs for the first time may be the strongest single justification for making the move to bypass technology.

Controlling local-loop communication costs is becoming more important. The cost of traditional local-loop services is increasing. Prior to the breakup of AT&T, long-distance services helped support local-loop services. The price of local exchange services was therefore artificially lower. Now, with the divestiture of the operating companies, local and long-distance services must pay for themselves. Charges for local services will increase and charges for some long distance services will decrease. Prudent companies should be exploring alternatives for both local-loop and long-haul commu-

An introduction and description of some of the leading bypass technologies follows:

Microwave and Digital Termination Systems. Private microwave is probably the oldest of the bypass technologies and the forerunner to the current communications revolution. Over the years, private microwave has gone from an exclusively analog format to now over 50% digital transmission. Digital microwave is clearly preferred for distances under 200 miles. Because of crowding in the private microwave spectrum, the FCC has allocated additional slots in the 18-GHz region. Where spectrum space is available, private microwave still makes sense for companies that have a large volume of point-to-point communications.

One new kind of microwave communications that has attracted a lot of attention is called the digital termination system. In the late 1970s, Litton Industries applied to the FCC for allocation of the microwave spectrum in the 10.55- to 10.68-GHz range. Litton wanted this bandwidth assigned for microwave cooking ovens because of its superior qualities for browning meat. Xerox Corp. had a better idea, however — it petitioned the FCC to set aside those frequencies for data communication services.

Xerox called their new communication service Xten. Xerox envisioned an office of the future where large numbers of documents would have to be transmitted between company locations. Communications bandwidth would be necessary to support this view of the office of the future. Fortunately, the FCC agreed that data communications was more important than browned meat.

The full concept of Xten included communicating from the local common carrier directly to a long distance carrier. That full concept has come to be called digital electronic message services (Dems). The part of Xten that bypasses the local loop is called a digital termination system. The DTS carrier for a community would position a multidirectional antenna on the top of a tall building. The carrier would then be able to transmit, as well as receive, high-bandwidth communications between itself

and its subscribers.

In 1980, an experiment was performed to validate the service concept. San Francisco and Manhattan were picked as the local areas. Tymnet, Inc. and LDD (a subsidiary of M/A-COM, Inc.) provided the microwave communications between subscribers and a central facility and San Francisco. From an earth station at Embarcadero Center long-haul transmission via a Satellite Business Systems satellite was accomplished. The information was received in New York City where it was distributed by Manhattan Cable Vision to offices. San Francisco was deemed an ideal place to test DTS because of its hills and its fog.

The experiment was a great success. The error rate was always better than one bit error in every 10<sup>8</sup> bits and was often better than one bit error in every 10<sup>11</sup> bits.

The FCC has established two kinds of communication carriers for DTS - extended carriers and limited carriers. An extended carrier must provide services in at least 30 cities and must commence offering services within 60 months of its approval. A bandwidth of 10 MHz, 5 MHz in each direction, is assigned in each community for subscriber communications. Spectrum allocation is available for seven extended carriers in any one city. Limited carriers need to provide communication services in only one city and to less than 30 cities. A limited carrier must commence providing services within 30 months of its approval by the FCC. There is sufficient bandwidth available so that six carriers may be offering limited services in any one location. Limited carriers can only offer 5 MHz transmission, 2.5 MHz in each direction, to their subscribers.

The FCC will only authorize carriers to operate in the DTS spectrum. Therefore, a company will not be permitted to use DTS to meet its internal needs exclusively. However, DTS carriers may seek to satisfy their internal communication requirements first, and

then they must sell excess capacity to the public.

DTS services are line-of-sight services. To reach some locations in some cities, a single DTS transmitting location may be insufficient. A DTS repeater station or alternate communication technologies, like cable, may be used to reach locations that are otherwise blocked by high build-

ings or other obstacles. DTS services are best suited for data communications and will compete with AT&T's Dataphone Digital Service. Even though DTS services are only now being implemented, their economies have been improving. Three years ago, it was universally agreed that the economics for DTS made it suitable only for data transmission. The cost of DTS has been declining and it appears that DTS may soon be suitable for voice communications. The capital cost for a DTS station has fallen by more than 50% in the last 12 months. DTS is an important bypass technology and it will help many companies to reduce the unit cost of their local communication transmissions

Cable TV. Coaxial cable has broad applicability for communications for both the local area network (within a facility) and the local loop (from a facility across town).

The typical cable TV franchise operates with the capacity of 56 to 108 full-motion video channels with bandwidths ranging from 330 to 440 MHz. Most of the original cable TV installations provide only one-way transmission from the cable carrier into the home.

Modern cable TV installation provides for two-way communications. Manhattan Cable Vision, in New York, is an example of what can be done using cable TV technology to support business. Its customers include Bankers Trust Co.; Citibank N.A.; Manufacturers Hanover Trust Co.; Shearson/American Express, Inc.; the city of New York; and Wang Laboratories, Inc. The service provides digital

data circuits to their customers ranging from 4,800 bit/sec to 1.544M bit/sec (or T-1). Where coaxial cable runs past a building, it can be very economical for communications.

Cellular Mobile Radio. Traditionally, mobile telephone service was provided by a single highpower antenna in the heart of a city. Mobile telephone services have not been without their problems. A vehicle at the outskirts of a city or moving behind tall buildings would often experience interference. Mobile telephone service typically had only 12 or 24 channels and could reasonably support only 500 to 1000 subscribers. During peak times of the day, there would be a fifteen minute wait before the subscriber was able to place a call. To minimize those delays, new subscribers were put on waiting lists, with a several years' wait required in some cities.

Cellular mobile radio promises to correct these deficiencies. Each community is broken up into a number of cells and a low-power antenna is placed in each cell. When a driver goes from one cell to the next, the system automatically senses that the signal is becoming stronger in the adjacent cell. The system then switches the transmission from the first cell to the second one. This switch happens so effectively that a subscriber rarely notices it and gets a relatively uniform signal. There may be many cells within a city, and frequencies can be reused from cell to cell. This frequency reuse makes it possible to service many more subscribers, perhaps as many as 100,000 in some locations.

The cost to subscribe to a cellular mobile radio system is about \$200 per month today. That cost includes the amortization of the hardware and the subscription fees. Many analysts expect that cost to be halved by 1985 and perhaps fall to as little as \$25 to \$50 per month some day. If that occurs, an argument can be made that cellular mobile radio may in fact replace the copper wiring that is go

ing into homes today.

In the near future, cellular mobile radio will make much more telephone service available as well as at a lower price. This fortunate phenomenon will make it much more feasible to establish data communication services between vehicles and offices. Vehicle data communication schemes, based on the AlohaNet research, make very effective use of mobile radio bandwidth.

#### More New Communications

FM radio stations have a new. valuable data communication franchise because of changing technology and regulation. The FCC has approved FM radio stations to offer 200 KHz of subcarrier bandwidth for communications resale. These subcarrier communications make sense where companies have to broadcast specific information to a large number of locations. For example, some companies are transmitting stock information in this way to specialized portable terminals, so that businessmen can monitor the performance of their stocks. This is the communication technology that comes closest to making Dick Tracy's wrist radio a reality. A self-contained FM station may be able to install subcarrier equipment for as little as \$5,000 to \$7,000. That is a very modest investment to make 200 KHz of communications bandwidth available on a broadcast basis.

Satellites have been used to bypass long-haul terrestrial facilities for several years. Thanks to the space shuttle, it has become both easier and cheaper to launch satellites. As satellites become larger and more powerful, the need for large satellite earth stations decreases. As the diameter of a satellite receiver shrinks to approximately two feet, it then becomes feasible to not only bypass longhaul, but also local-loop facilities. The electronics are complicated, but very large-scale integrated circuits promise to bring down their costs. In addition, when earth stations become inexpensive enough, companies will broadcast directly from satellites to the receiving location. Finally, the FCC has recognized direct broadcast satellites (at least for home use) and has allocated the 12.2 to 12.7 GHz region for such satellites.

Infrared and even visible light offer communication alternatives over relatively short distances. For example, the cost to transmit data across a street may be prohibitive in some cities. If a line of sight can be established between two buildings across the street, then infrared or visible light may provide a communications solution.

Fiber optics is another technology that promises to transmit great bandwidth with great accuracy. Electrical interference is not a problem with fiber optics, so the accuracy of the transmission is excellent. Unfortunately, the techniques for splicing and tapping optical fibers have not been refined, which limits their effectiveness over short distances. Over longer distances, fiber optics makes sense and plays an important role in at least one of the new teleports.

Teleports are not a communication technology, but represent the bundling of communication technologies in a useful way. As its name implies, a teleport is a place where communications facilities are concentrated. A teleport might have several earth stations pointing to several different satellites. Then, bypass technologies would be used to distribute the long-haul communications to businesses within nearby communities.

The best known teleport is the joint venture between Merrill Lynch, Pierce, Fenner and Smith, Inc. and the Port Authority of New York and New Jersey. This group is building a satellite earth station complex on Staten Island, with earth stations directed toward many major satellites. From Staten Island, they are stringing fiber-optic cables through the Port Authority Trans Hudson (Path) tubes into the major centers in Manhattan. Selected cities will be served in New Jersey along the Path route as well,

including Jersey City and Hoboken. A teleport, then, is a consortion of communication services designed to provide the local region with a variety of voice, data and video communications while bypassing traditional communication facilities. Teleports are springing up in a number of major cities.

Which bypass technology should the buyer select? Probably several of them. Smart companies will be mixing and matching their local and long-distance communication technologies to meet their particular communications profile. The bandwidth, flexibility and economics of various bypass technologies may well mandate that several different technologies will be used in any one city and that all the bypass technologies will be used in one place or another within the overall corporate network. Information is so essential to modern companies that their very survival may depend upon a sound communication strategy.

Communication costs changing dramatically. If companies fail to take advantage of new communication technologies. their cost per unit of communications will increase - perhaps significantly. On the other hand, the new communication technologies hold out the promise of reducing the cost per unit of communications. Bypass and other new communication technologies will provide more communication power, new services, greater flexibility, and lower costs than every before. Companies must control their communication destiny. For the first time bypass technologies for the local loop are beginning to offer an economical, feasible communications pathways. a

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INTERVIEW

# LEON'A R D CUMOCK

By Marcia Blumenthal Leonard Kleinrock is a one-man communications network. He is a professor in the computer science department at the University of California at Los Angeles. Almost constantly on the move, Klehrrock traverses the country conducting numerous data communications courses for information processing managers through Technology Transfer Institute, a conference management firm of which be is presideut. A lively speaker. Kleinrock is a well-known participant at major industry conferences. His research interests focus

His research interests focus on computer networks, packet switching and local-area networks.

#### NTERVIEW

How would you characterize today's data communications environment?

Right now it's a zoo. Many technological possibilities are being explored by scientists and the outlook for new products is enormous, but nothing has settled down yet.

There are four groups of players in this environment, each pushing its own goals. The scientists are constantly coming up with new ideas, each of which appears to dominate previous ideas. But these ideas are two or three years away from products. Then there are the vendors who want the scientists to make up their minds so they can transfer the idea onto silicon and sell it.

The users are sitting around waiting for delivery on all these lovely new products they've been promised. And the standards organizations are caving in to vendors and users who keep saying they need standards, but have no idea what they should be.

One opportunity is that we are finally seeing the convergence of data processing and communications, but it's taken more than a decade for that to occur.

What is causing this convergence?

Integrated chips. Data communications needs intelligence in its products and information processing needs communications for distributed systems. It's hard to separate them right now. We are becoming a world of interconnected computer networks.

Wide-area networks using packet-switching technology have been around since the early 1970s, but it took the telephone company [AT&T] 13 years before it started offering this service through its AIS/Net 1000.

What's on the horizon for the user?

All the technology is on the horizon — local-area, metropolitan and international networks, fiber

optics, cellular radio and so forth, but except for long-haul networks the products are not here yet.

With all this uncertainty, what advice do you have for users wishing to install advanced data communications products, such as local-area networks?

Users who are looking at products such as local-area networks have to recognize that if they opt for a particular product now, in two or three years there will be a new set of standards and products which may not be compatible with what they select now. They may have to rip out what they put in today and replace it — not the wiring but the interfacing.

If I were a corporate executive making the decision today, I would ask whether the system would pay for itself in two or three years. If so, then there is no question about installing a local net, but if it won't pay for itself the decision becomes harder. It's an interesting calculation because corporations that delay adopting advanced communications techniques now may lose far more in lost opportunity than the cost of the investment.

Do you see more users making the move to install local net-

Some are and some are not. Today, most organizations are not installing local networks on a production basis. They are installing them on a limited, experimental basis. Most are using the classic PBX as a switch because the machine is already in place.

But despite the user's current hesitation in installing local nets, anyone building a new facility should put in the appropriate duct work for whatever cabling comes along in the future — and that includes fiber optics.

Since this switching equipment is in place, does this mean the star configuration will prevail?

People are moving in this direc-

tion because they are familiar with it. The star, which transfers data at about 64K byte/sec, is fine for most needs, but not all. It won't handle teleconferencing and it's slow when moving files around. More than likely, terminals will be intelligent workstations with possibly a 10M-byte hard disk. And if the central switch fails, no one can talk to one another.

On the other hand, vendors of these branch exchanges have been very good about building highly reliable devices using modular redundancy. There are high up-front costs with these devices, but it is a competitive technology.

Incidentally, IBM is taking an interesting approach with its ring wiring concentrators. By running wires out to a terminal and back to its cabinet, IBM makes the network look like a star, but it is really a ring. All the maintenance and configuration changes can be done from the cabinet.

What is keeping people from installing local networks on a production basis?

It is the lack of stabilization. Standards are just beginning to be approved. Chip sets are beginning to appear now. People don't want to be guinea pigs, so they are willing to run experiments, but not commit a corporation's basic operation to any particular product.

Another question users have with local networks is whether they are committed to a particular vendor's office automation solution if they opt for that vendor's local net. In a lot of cases the answer is yes and organizations are not pleased with this prospect and are waiting for a universal local net.

What is the outlook for a universal network?

This standards business is going to be around for a long time. We will never get out of it completely or have complete standardization. There is enormous opportunity for conversion products.

A hot product area today is

### INTERVIEW

"bridges and gateways." A gateway is a device that connects two networks which have different protocols while a bridge is a device that connects two networks that have similar characteristics. The user pays more for that device and loses some efficiency, but it's an interim solution and we'll be in this environment for some time to come.

#### Do you see any one system which is better than most?

The best system depends on the parameters of the applications. Parameters include the bandwidth you need, the length of cable, how many bits will be sent in a block, the number of devices to be attached and so forth.

Some vendors are offering products that will not grow well as bandwith expands and longer cables become available. For example, [Xerox Corp.'s] Ethernet using CSMA/CD [carrier-sense multiple access/collision detect] does not operate well as bandwidth goes up, yet it has its place in the applications spectrum where it works. So with an Ethernet-based system you may eventually need more than one network.

Hiring a consultant is a good way of assisting in the purchase decision. But not all consultants are prepared to carry out a complete performance evaluation which describes where the system will begin to fail or where its limits are. And some consultants are committed to one vendor's approach. Users should hire a consultant who can challenge vendors.

#### How close to commercial reality is fiber-optics transmission?

As I mentioned before, anyone planning a new facility should install the ducts for fiber optics. This technology is very fast for point-to-point transmission — you can send the entire Webster's unabridged dictionary in a few seconds. Fiber optics carries light better than copper wire carries electricity. It offers the potential for enormous bandwidth, low error rates and it is immune to electromagnetic interfer-

ence, a feature the military and government find very attractive.

But we don't know how to tap into it without a lot of loss and expense. If 10 taps are put in along the line, the power coming out the end of the line is about 1/1,000 of what went in. The tapping will take about three to four years to solve.

For the user it's clearly an issue of economics. The organization doesn't care how exotic the medium is, but whether it is cost-effective for the bandwith as well as being expandable. It can be a string and a can as long as it does the right job. The question is how much these taps cost — do you need a few gigabytes per second or can you live with 50M byte/sec?

It seems like videoconferencing is not as promising a network feature as was predicted. Are there other features which were being touted in the past that may not be as necessary now as once thought?

Video is not an enormous need right now. It's important for certain applications, but not too many corporate applications.

Clearly textual transmission is needed and facsimile is useful. Voice and data are certainly something that is needed, but whether they should be integrated is another question. When speech understanding technology is perfected there will be a greater need to mix voice and data.

Certainly the user would prefer to use a single terminal to initiate communications, but whether all transmission must go over the same wire is still a question.

The user has to be sensitive to the possibility of overbuilding the communications plant.

# What will the organization's communications network look like in the future?

It's my guess at the lowest level there will be a shared logic machine, like a supermicro, that will serve from four to 16 people in a local cluster, perhaps acting as a file server. There will be a collection of these devices on a floor, communicating through a cable to other floors, coming into a computerized branch exchange.

From here the information would move into a metropolitan network, with gateways to value-added networks and satellites. Unfortunately the metropolitan network is confusing and users will have to wait a number of years before vendors provide metropolitan networks. Cellular radio, for example, is in its infancy and it is not yet determined how it will serve communications.

Unfortunately, the communications issue can become a nightmare, much like what has happened with the personal computer.

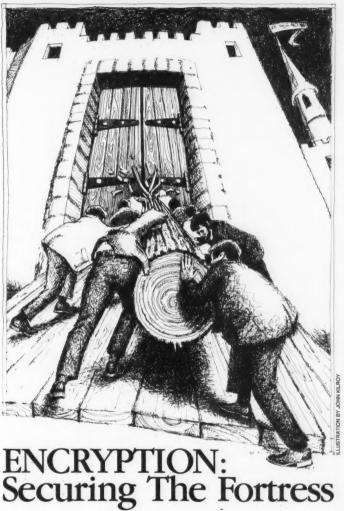
#### How do you prevent this?

There have to be changes in the corporate organization which recognize the information resource manager as a high-level executive. This person would be well-versed in information processing and data communications, disciplines which in many instances are separate today. These two specialities must be melded.

#### Are there any other changes that have to be made?

Issues in communications, particularly local nets, are largely hardware and protocol-oriented, but systems software must be considered. There is an enormous installed base of Cobol-based probut building applications is a slow process. With increased on-line transactions necessary and users connecting into local networks to access corporate data, the organization must embrace the new generation of applications development and data base products.

The most popular personal computer software products are very user friendly. Building user-friendly interfaces is probably the most difficult task necessary for solving this problem. This type of system is more than five years away.



By Laura Brown Schlafly

In 1977, personnel at the U.S. Federal Reserve Bank in Minneapolis verified by secret password an apparently legitimate request to transfer funds to a Georgia bank account, which they later learned belonged to a wire-fraud expert.

In 1982, Japan's Nippon Telephone and Telegraph Co. found its lines being tapped and its data stolen by a credit card forgery ring.

Last year, in Los Angeles, a 19-year-old University of California student used his home computer to break into a Defense Department communications system.

And a few months ago in Fort Lauderdale, Fla., two computer technicians manipulated a personal computer and a push-button telephone to penetrate the computer files of IBM; Sears, Roebuck and Co.; Gould, Inc.; and The Miami Herald.

In these and in many other incidents of unauthorized computer

access, information processing experts noted how easily the wrongdoers, especially the novices and hackers, gained entry into various data transfer networks. Speculation continues as never before on the numbers of such incidents both undetected or unreported as well as on the potential capabilities of a truly expert computer thief.

The reality of computer crime and accidental access to any data bank cannot be overstated today, particularly in light of the ever-increasing volumes of computer data gathered and stored not just for government and business purposes, but also for personal reasons. Current industry estimates of such losses range from \$100 million to \$3 billion annually. More than a few industry observers predict that computer crime will generate catastrophic losses for some financial and corporate organizations by mid-decade, regardless of precautions. To the extent computer security increases, so will the expertise of computer thieves. Although advanced security techniques may reduce the number of perpetrators and the crimes they commit, it may also vastly escalate the losses they create because only the true professional gambling for a high payoff will risk invasion of the system.

The best deterrents to computer

crime today include site controls. personnel controls, password controls, file access controls and other controls, not the least of which is securing computer data during transmission. Each deterrent is far too extensive a subject to cover in depth here, and the discussion that follows will be confined to safeguarding computer data during transmission. A problem with computer data, either stored or in transit, is that it cannot be seen. There-

ENCRYPTOR MODEM MODEM ENCRYPTOR ENCAYFTOR ENCRYPTOR CPI Figure 1

fore its loss, intentional or otherwise, can be easily overlooked. Both the programs that perform the processing and the transmission of data are invisible to the human eve. At best they are magnetic spots on tape or disks, or electrical impulses being transmitted through a computer and over its data communications network. Understandably they receive less scrutiny than office paperwork or fixed assets.

In fact, of the five very general computer functions - input, programming, processing, output and data communications - the latter is said to be one of the most vulnerable to penetration and theft. Data communications systems of various magnitudes serve most government, commercial, industrial and financial organizations to-

Computer crime experts claim many data thefts, manipulations and inadvertent losses go unreported each year. The most frequently cited reason is publicity. Widespread knowledge of such incidents would cause great embarrassment in most cases, not to mention possible liabilities. Like cash, property, production techniques, personnel and goodwill, information is considered a major corporate and organizational asset. Its loss or alteration may prove just as serious, or more so, as the loss of any other asset. Personnel data,

> for example, must be safeguarded under the Privacy Act of 1974. Other confidential data concerning customers and clients, accounting, financial planning, marketing strategies, designs, research and development, production techniques and other operational areas are, in most cases, sufficiently important to be safeguarded, particularly if transmitted over

data communications networks.

Most networks transmit a considerable amount of information of a sensitive or proprietary nature. Criminal access can be gained by accessing an organization's own terminals, by attaching foreign terminals or communications devices directly to the data communications phone lines or merely by dialing into a computer site having autoanswer equipment. Virtually any point in the communications links may be vulnerable through a dial-up port at an outside timesharing house, at a point near the CPU facility or at an unattended communications facility. In addition, communications interception kits for data theft or manipulation can be assembled inexpensively. Powerful minicomputers, which can be leased, can also be programmed and used to dial into a system and masquerade as an authentic terminal, apparently conducting routine business transactions with the computer.

The only adequate safeguard against the theft or inadvertent, unauthorized access of data being transmitted over various media is data encryption. This singular method renders data incomprehensible and useless if lost or intercepted. Some equipment also stores the data in encrypted form. Encryption proves highly effective in maintaining data security when data communications messages are

mistakenly misrouted, in the protection of computer-readable ID card passwords and in offering the utility for digitally signing messages.

Unfortunately for many users the acceptance of data encryption has grown slowly. The failure to use encryption during data transmission may well be the result of users not understanding the need. The situa-

tion might be analogous to a time when increasing numbers of bank robberies and their attendant publicity created the need for armed guards and armored trucks. Or a time when commercial, industrial and institutional break-ins and burglaries created the need for better site controls and more sophisticated security staffs. The fact is that many organizations do not perceive proprietary data in transit as a high-risk factor.

Banks know better. In fact, the heaviest users of data encryption are banks and other financial institutions. Bank transactions in which depositors' personal identification numbers are transmitted must use encryption. And many members of the banking community agree that unless the integrity of data in other financial and business areas is similarly secured, encryption may one day be required — either by regulation or legislation. The reason being that a company's board of di-

rectors, for example, might well be held personally responsible for the loss of assets. Shareholder, customer and other affected interests might well seek legal remedy.

Another possible reason for the slow acceptance of data encryption is the misperceptions by users of its cost and usage. In a recent trade publication article, for example, an industry observer voiced concern over the low price of large-scale integrated chips used in the design

DIAL-UP MODEM

ENCRYPTOR

ENCRYPTOR

FACSIMILE

Figure 2

Chart Courtesy of Recal-Milgo, is

of encryptors and the comparatively high price of the encryptors themselves. The same criticism might be made of the price for an automotive starter motor and the price of the automobile on a dealer's showroom floor. A great deal of design and engineering go into the finished product, as does manufacturing — plus personnel time and talents.

Few data encryption vendors, if any, would place themselves in a defensive position over pricing. A low to medium four-figure price for a highly advanced data encryption device can be justified to protect the enormous tangible and intangible value of proprietary and confidential data, just as the price of a computer can be justified to store and provide various uses of the data. That the price of an encryptor sometimes exceeds the price of the terminal device it supports is another invalid criticism.

The functions of the encryptor

and the terminal cannot be compared. They are functionally and conceptually unrelated. To pay less in some instances for certain terminals than their encryption devices is perhaps no different than to pay less for the doors of one's home than for the surveillance or alarm systems that guard them. The decision to buy or not to buy must be based upon the value one places on the content of the data.

Figure 1, on page 36, and Figure

2, on the left, show two simplistic network situations that might help many users in considering encryption costs. In the configurations shown, the encryptors are the interface between modems and data terminal equipment. According to industry research data, the average per-unit price of an encryption device is \$2,200 without options such as diagnostics or spe-

cial encryption key management features. Central site, master units typically cost more than remote devices because they are designed to serve many remote units. A reasonable average price to expect in Figure 1 would be \$2,500 per central unit and somewhat less for each remote, or just under \$5,000 per link. A price of \$2,500 for the master and \$2,050 for each added remote would, in fact, be very competitive.

Figure 2 shows a dial-up configuration, and while nearly all encryptors can be used on circuit-switched, dial-up networks, some are designed specifically for that purpose, as well as for other special purposes. The dial-ups, for example, may be designed to create and download new transmission session keys for each modem connection and, when the modems disconnect at the session's end, to erase the keys at each end of the link. Special designs will typically

raise the industry-average, per-unit prices — and also significantly increase the security of the data link. Quantity purchases of encryptors will, of course, lower the average per-unit prices cited above.

As to the actual usage of an encryption device, most competitive models are no more complicated to operate than hand-held calculators. User apprehensions about extensive and specialiazed personnel training is unfounded. Most vendors, in fact, provide the necessary operational training, which is minimal. Most also provide field service support.

More germane to usage concerns are considerations of the encryptor's size and operational integrity. Obviously the physical size of encryptors varies from vendor to vendor, as do special requirements for any given application. Because encryptors typically interface at modem locations the size factor must be taken into account during user evaluations. Moreover, encryption devices are yet another insertion in the communications medium and results in a data rate delay. This phenomenon heightens the importance of operational integrity.

While the actual use of encryption devices presents little or no difficulty, the way they operate involves many complexities. In order to make data unintelligible for transmission, encryptors break down data into the simplest possible form, which consists of a bit, that is, either a "1" or a "0." Encryptors then modify single bits or bytes, depending upon their design. The modification process follows the rule of an algorithm, which by definition is a fixed procedure for step-by-step problem solving, or in this case for step-bystep transformations and permutations of bits or bytes. An untried, unproven algorithm may obviously lack operational integrity and fall victim to cryptanalysis, which is the technique used to decipher messages, in this case for illegal or unauthorized purposes. Such algorithms as those found in certain scramblers, for example, are highly predictable in their mathematical transformation procedures and cannot withstand the best efforts of cryptanalysis. Today's most tested and proven algorithm for commercial and industrial use, as well as for nonclassified governmental use, is called the Data Encryption Standard (DES).

In 1977, the National Bureau of Standards agreed upon the DES algorithm for such uses. In the DES algorithm, the encryption of plain text into unintelligible cipher text for transmission is based upon a series of 72 quadrillion transformation combinations. The specific combination chosen for a given encryption process is called the key, which remains secret to the user. Some encryption experts estimate it would take hundreds of years for an eavesdropper to search out all the possible key combinations (72 quadrillion) made possible by the DES algorithm. And should that problem not seem sufficiently difficult, an encryption device user might then use the secret key once or a few times, then change it - or use the DES algorithm to encrypt data twice, which would extend the key possibilities from 72 quadrillion (256) to what might be called the semi-infinite (2112)

Manufacturers that offer DES algorithm-based devices include Paradyne Corp., IBM, Analytics, Racal-Milgo, Inc. and others. Although the devices made by such companies are based upon different applications, techniques, and equipment arrangements, they display many similarities. Each uses the DES algorithm, as noted. Each requires the placement of encryptors (which encrypt and decrypt in the same sense modems modulate and demodulate) on the data flow between computers and terminals. In the DES algorithm of such devices, a 56-bit key is used to transform data before transmission and after reception. Because the 56-bit key must be in the possession of both sender and receiver, a significant problem is how to safely transmit that key from one to the other — and to change it frequently enough and retransmit it to keep the data secure.

Ordinarily the secret key must be set or loaded into the encryption devices at each end of the data without anyone gaining knowledge of the key's value. And the key must always lend itself to modification by the user at both ends of the communication link. Therefore the security of data encryption devices depends almost exclusively upon key management, that is, upon the secrecy of the key and upon its physical distribution by courier or mail, which may prove perfectly adequate for some users' needs.

For other users, a more sophisticated key management scheme is desired. This can operate on what may be described as a two-level key hierarchy. In standard operation, the secret "working" key, or data encrypting key, is contained in both a central encryptor at the computer center and in the remote encryptors. This key encrypts and decrypts data using the DES algorithm. A "master" key, or key-encrypting key, is also used at each site, central and remote, to encrypt the working key as it is transmitted over a link. In this way the working keys can be randomly generated or downloaded. And with the master key they can be changed at any time. This brings up a potential problem: if the working key can be encrypted by the master key, what if the user wanted to change the master key itself? At this point, distribution of a new master key would again be necessary by mail or courier.

One way around the key management problem is public-key cryptography. For key management purposes, Racal-Milgo's encryption devices, called Datacryptors, use a cryptographic method called public-key cryptography. The public-key method is used to electronically distribute secure master keys to remote sites, which permits frequents changes of master keys. Very generally, this meth-

od uses two separate keys of its own, a private key and a public key, for the encryption and decryption of data - not main-channel data, but key management data. Only the private key can decrypt messages encrypted by the public key. Public key cryptography had been a theoretical subject confined to academic discussion for many years. The method is based upon the generation of extremely large and random prime numbers for use in the public key encryption and decryption processes. The hardware and other necessities to generate very rapidly such primes was designed and developed by Racal-Milgo in mid-1981.

Another feature for users to consider is whether the encryption device they select is protocol-sensi-OL protocol-transparent. Transparency appears to be the more desirable method for flexibility and versatility. Transparent encryptors operate on a method called single-bit cipher feedback, in which single bits of data, as earlier described, rather than characters, are encrypted and decrypted. In this way the encryptor remains free of any hardware and software constraints. It can remain in place as computer networks expand or change, and it will require no retrofitting or reconfiguration. Such devices operate at data rates of up to 112K bit/sec, half- or full-duplex, and on either leased or dialup telephone lines, or over microwave and satellite links.

For all their complexity, encryption devices are merely installed in a user's network as a "black box" between sending and receiving ends of each communications link. They can be operated in what might be described as a push-button mode. Most units securely mount on either desktops or racks, and their removal or the opening in their front panels requires the use of dual controls. Their data encrypting key is typically erased automatically if unauthorized access is attempted. In addition to this, in the event of power failures or interruptions, the encrypting key is protected by battery backup and therefore retains its key val-

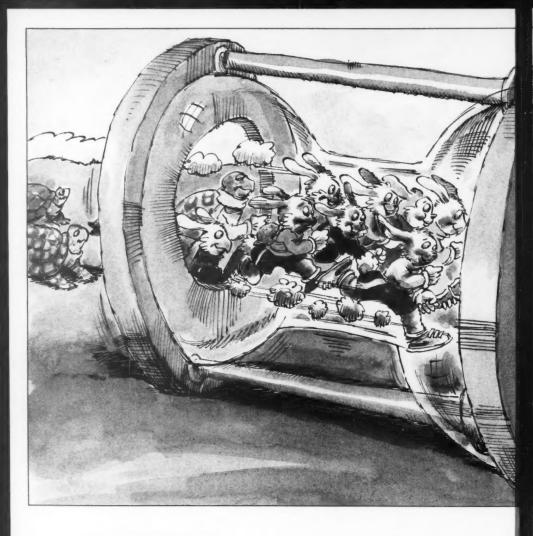
The need for many business organizations to protect their data by encryption methods is perhaps not as immediately acute as it is for banks or credit reporting organizations, which might obviously vioconfidentiality. However, much of the data transferred by businesses are every bit as sensitive. For whatever reason and to what extent such data might be intercepted, and what that might cost the victims, are determinations that can only be made by the individual organizations concerned. Compounding these determinations, of course, is the tremendous growth of computers and data communications in virtually every area of business, as well as in the home.

The alternative to data encryp-

tion - even assuming that site controls, personnel controls, password controls, file access controls and similar measures have been evaluated and implemented - is simply accepting a high risk or loss. However, the likelihood of auditors and insurance companies accepting such high risks is minimal. In fact, in the not-too-distant future, auditors and insurance companies may demand senior management to take measures to decrease the probability of such losses. As higher levels of corporate management become more and more involved in protecting information assets, the data processing managers and data communications managers will not remain the decision makers for or against encryption.

The reason is not unlike the reason that banks require its use. As mentioned earlier, a company's board of directors may well be held responsible for the loss of assets, which include proprietary and confidential data. Such losses may be prevented if the data were secured during transmission. For the future, it should become evident that calculating the value of information assets, identifying how vulnerable they are to theft. and then protecting them will cost significantly less than rectifying such losses after the fact. ..

Schlafly is marketing manager for digital products at Racal-Milgo in Miami, Fla.



# MIXING IT UP WITH MUXES By James J. Mice

By James J. Michaels

If transmission over phone lines was free, multiplexing techniques that share a facility or a line among many data or voice conversations would not be very popular. But rising line charges - and the valueadded features of multiplexers have made the multiplexer a cornerstone of communications networks.

Multiplexing techniques have



evolved from the earliest frequency-division multiplexers (FDM), to time-division multiplexers (TDM), to today's STDM, or statistical time-division multiplexers. A new generation of TDMs are, in turn, evolving into a new class of communications network processors.

A time-division multiplexer carries dedicated virtual circuits. The time on the communications line is divided into cycles of equal length and each device attached to the TDM "owns" a fixed interval of time in each cycle. Each device is assigned a constant bandwidth, whether it is transmitting or not. Therefore, the sum of the speeds fall input devices cannot exceed the speed of the composite link.

A statistical multiplexer dynamically allocates bandwidth to a device only when it has data to send. Statistically speaking, devices such as terminals are idle most of the time. So the sum of the inputs to a statistical multiplexer can be many times the speed of the line — four to eight times is typical.

Basically, all these devices — FDM, TDM, STDM — can be networking devices. The key question is how to create an easily man-

aged, practical and cost-efficient network using these components.

An ideal network would offer the user a number of advantages. It would provide universal compatibility, handle different types of transmission facilities, provide centralized management and diagnostics and be upwardly compatible. As the network grew, the system operator would be able to add more and varied network devices.

In such an ideal network, the network manager would have very efficient resource utilization. All users would have the ability to access any system resource on the network, such as distributed com-

puters.

Ideal networks would be nice, but they do not exist. Most networking today is driven by computers. The problem with using computers for networking is that they use line bandwidth inefficiently. The computer is designed for crunching numbers and for manipulating data. Most computers get bogged down when they have to perform networking chores. And when they get bogged down, the system does not utilize the bandwidth in a cost-effective manner.

Most large computers drive a network with a fixed protocol, usually one designed for a particular type of data. If the user starts moving different types of data, efficiency can drop. Also, since computer systems are generally single-vendor devices, a mixed environment in which a number of different computers are joined in a network does not always work effectively or may not work at all.

This compatibility problem with computer-based networking demands devices (such as multiplexers) which remove data communications management from the

computer.

The key word in designing any network, then, is flexibility. The network must be able to handle any kind of device the user may want to attach. The network should convert protocols, switch connections, change speeds and other

tasks necessary to ensure compatibility and flexibility. The network must also anticipate increases in the speeds of transmission, growth in the numbers and kinds of devices that will be attached to it.

There are three basic principles that must be recognized in putting

together a network:

• The network will not get smaller. Networks tend to grow. As more users come on-line and each workstation ends up having a terminal attached to it the network will keep growing.

 Networks will never become slower. Speed is addictive in data communications. Once users have had access to a 9,600 bit/sec terminal, they will never willingly go

back to 1,200 bit/sec.

 The network will never stay the same. What is new today becomes old hat tomorrow. The system manager needs to purchase products that are upwardly and downwardly compatible so the system can grow.

Some data communications suppliers are responding with a systems approach that offers one-stop sourcing for an entire network. A single source ensures that components are compatible and will continue to be compatible with equipment introduced in the future.

Once a network has been built and hardware devices distributed throughout the system, centralized data network management and maintenance becomes vital. The network operator needs to monitor what is going on with the network at all times — how it is being utilized and what kind of problems users are experiencing.

From one point in the network, the operator requires total network management and diagnostic capabilities. When problems arise these diagnostics permit the operator to delve deeper into the network to determine the exact misfunctions.

Large mainframe computers can be used to manage a communications network directly, but using a very expensive CPU for error checking, protocol handling and diagnostics is an inefficient use of resources. Moreover, the CPU vendor then guides the future direction of the network's development. The trend is to offload communications management functions onto the network.

Front-end processors, specialized computers optimized for and dedicated to communications functions, relieve the mainframe of network management. But front-end processors are themselves expensive and sometimes dedicated to a few protocols or one vendor's products.

Traditional modem makers have incorporated diagnostics and control features into their products. But since modems are the most numerous devices in most networks, the cost of this added functionality can add enormous over-

head to the network.

Multiplexer makers have been adding diagnostics and control features into their products as well. The advantage of multiplexers is that fewer are required and they are connected to a larger percentage of the network. Where a modem sees only one input and output line, a multiplexer can see six composite links and more than one hundred user ports.

New features being added to multiplexers — multiple data links, switching, among others — are driven by the need to manage the network. As it takes on more functionality, the multiplexer is evolving into a type of front-end processor.

#### **Network Applications**

As the capabilities of multiplexers have increased, they support exceedingly complex network topologies. No longer is each point-to-point line a separate entity, requiring separate attention. Networking multiplexers are tying everything together.

One of the basic methods multiplexers use to tie a network together is to have multiple composite data links. With multiple data links, a single phone line can route to more than one location. Although not all multiplexers have the multiple-link feature, this is the direction products are moving and it is an important new development for networking.

Imagine a network joining Chicago, Atlanta and New York. With single-link multiplexers, there would usually be three phone lines, one between each city pair, and two multiplexers in each city. If the Chicago-Atlanta line was removed it would be necessary for their circuits to be connected between the ports of the two multiplexers in New York in order for those two cities to talk. Note that each Chicago-Atlanta channel requires four multiplexer ports and, in the event of rerouting, a manual patch change.

If one multiplexer supports two data links, then only one multiplexer is needed in each city. It doesn't make sense to have the Atlanta-Chicago circuits come out at one multiplexer port in New York and go back into another port on the same multiplexer.

A bypass feature in the multiplexer, which has been available for a number of years, eliminates the need for back-to-back multiplexers or in-and-out patching at intermediate points. Data is passed from one composite link to another directly. This means that there could be 24 channels between Atlanta and Chicago passing through a four-channel multiplexer in New York.

If three lines were maintained on the triangular network, multiple data link multiplexers can offer alternate routes in case of line or equipment failure. In a trinode setup, for example, stored tables permit the multiplexers to revert to a bypass situation when a link goes down. This means more overall reliability.

If the network requires a considerable amount of bandwidth between two nodes, the multiple lines on a statistical multiplexer can be used in parallel to increase the throughput. Each link carries its rated capacity independently. If there are two 9,600 bit/sec lines

between a pair of statistical multiplexers, the connected terminals seem to be sharing a single 19,200 bit/sec line.

Dynamic load sharing, or traffic balancing, on dual data links means that the network operator gets to utilize all the bandwidth.

Information from a specific terminal can go through either data link, automatically going to the link with the lowest load factor. When one data link goes down, it is seen as full since nothing is going into it. All data then goes through the working link.

These automatic fallback and redundancy features are most effective if the two data links are diversely routed, by either coaxial cables or land lines.

#### Switching

If the network operator wants a terminal to access separate systems resources the most cost-effective solution is switching multiplexers, currently one of the fastest growing segments of the multiplexer market.

With full switching capabilities, essentially all the features of a data private branch exchange (PBX) or the dial-up telephone network are available. The user can access any node or any port in the network. Any terminal can connect to any resource. This gives multifunction capabilities to the terminals.

For example, one terminal can function as a word processor, a spreadsheet analyzer or an engineering design station — simply by connecting to the appropriate computer on the network. A single computer, going out through a switching multiplexer, can select the best printer for a specific job dot matrix, flatbed plotter, laser and so forth.

To manage all these users and their access to multiple resources, newer switching multiplexes make it possible to define, for any terminal, precise access rights to each of the various resources spread around the network.

Closed user group options, a feature of switching multiplexers,

allow the network manager to exercise more complete control over the usage of system resources by excluding any terminal not specifically admitted.

#### High Speed and T-1

Today's networking applications, which use traditional voicegrade data links, face speed restrictions. The coming generation of multiplexers will provide significantly higher speed capabilities and the network management tools to utilize this increased bandwidth for a variety of office automation applications.

T-1 rate links (1.544M bit/sec) provide an answer to the total speed problem. T-1 rate costs are plummeting, thus creating cheaper bandwidth.

New multiplexers make this ultrawide bandwidth practical by splitting it into more familiar "chunks," such as 9,600 bit/sec. The beauty of the latest T-1 multiplexers is convenience and their flexibility to tailor the "chunks" precisely to fit a user's need. To accomplish this, the data communications industry has taken a new look at TDM techniques.

Recall that TDM was defined previously in terms of dedicated virtual circuits and constant bandwidth. The implication was that TDMs were static, a statement which was true in the past.

Old technology TDMs were very hard to program; they had lots of straps, often physical straps as well as switches. The combinations of port speeds that could be programmed were usually limited, particularly when dealing with the random assortment of speeds and terminal parameters encountered in the average mixed system.

The older TDMs were also limited in diagnostics and offered limited or nonexistent statistics. Almost all were incapable of attaching to a unified network management system.

The new generation of TDMs are a great leap forward, particularly because of automatic reframing. This feature uses microprocessor

control to interpret relatively simple instructions from the operator and programs the "straps" in memory. The time intervals assigned to each port are shifted easily. Not only are these TDMs easier to program, but being designed for data (rather than being derived from voice channel banks), they are flexible enough to combine any type of digital information — data, compressed video, facsimile, digitized voice and so on — over one circuit.

Most large companies today operate multiple networks, running voice, data, facsimile equipment and video in parallel. Unifying these functions into one network not only cuts costs, but puts the entire communications network under a single management system. The T-1 facilities management systems in the new generation of TDMs provide a single system networking solution for all of a user's communications needs.

The argument is made that most users do not have megabit bandwidth requirements. True, not all computers can use the full 1.5M bit/sec capacity. But by combining voice, video and data, there is often more than enough bandwidth to justify T-1.

But aren't they fundamentally different kinds of information? Not at all. While compressing video signals from several megahertz analog to digital bit streams of less than 500K bit/sec is still the province of specialized coder/decoders (codecs), these television devices are available and produce a standard digital output. T-1 multiplexers themselves are adding integral voice digitization through special I/O cards. Using the latest techniques for voice coding, it is possible to convert a normal conversation to 32K bit/sec (half the Bell standard) and below.

What does it mean to a user to have a hotshot T-1 multiplexer with super-sophisticated automatic reframing? Let's look at one short scenario.

You have the T-1 bandwidth and have adapted your present facsimile machines to much higher speeds: a full page now takes two seconds. You have a standard video compression codec that requires less than 500K bit/sec. Both machines are installed in the boardroom, where the president is now holding a videoconference.

The chief engineer in another state comes to a point where he wants to hand the president a drawing. Instead, he puts it in the facsimile transmitter. With advanced bandwidth allocation, a T-1 multiplexer might have to interrupt the video signal for two seconds while the drawing is sent. The video picture would be frozen temporarily, but might not even be noticed by the people participating in the videoconference.

The new TDMs with T-1 rates will provide dynamic bandwidth contention that makes such feats possible. This is not allocation, nor statistical multiplexing, but contention among users attached to the network. Until a device bids for the bandwidth, no bandwidth is allocated to it. This gives the network operator a great deal of flexibility because the aggregate speed of attached devices can be more than the bandwidth of the data link.

If T-1 TDMs can do all that then some would suggest statistically multiplexing at T-1 rates. Unfortunately, for two main reasons, this technique does not work.

The first reason is due to delays. Statistical multiplexers buffer input data to prepare it for sharing the composite link. This takes time, and introduces a variable delay that means nothing to an interactive CRT terminal, but will be unacceptable in a voice conversation.

The second reason is transparency. A TDM is not sensitive to protocols — a statistical multiplexer is. Any form of data can be handled with a TDM.

In addition, the inputs to T-1 are

usually high-duty cycle: voice, computer-to-computer links, remote job entry and so forth. Statistical multiplexing simply eliminates idle time — if there is no idle time, then the statistical multiplexer offers no advantage.

Another multiplexer feature becoming more important as networks grow is enhanced diagnostics. Of great importance is systemwide alarm reporting of any fault in the network to a singlepoint. For the sake of the operator, single-point diagnostics are essential and are becoming more widely available.

In the near future the intelligence being brought into the new TDMs will make it possible to transfer this single control point to different locations. In this way control can follow the day shift from time zone to time zone, or be passed to anyone available after a disaster.

Part of this control is due to electronic patch features that provide total port and destination independence for the network. The next logical enhancement in TDMs will be an ability to work with future generation PBXs to deliver more integrated services.

Data multiplexers and the new generation of T-1 rate TDMs, with more advanced features and intelligence, are approaching the former functions of front-end processors. They provide powerful tools for solving networking requirements, and will become even more powerful in the near future.

Multiple T-1 links, with bypass and alternate routing, reduced bandwidth, digital voice and dynamic bandwidth contention are announced features that are being introduced by vendors today. Juggling of bandwidth and tricks with automatic reframing will take more time.

Michaels is a member of the staff of the product planning department of Timeplex, Inc., located in Woodcliff Lake, N.I.

# Keeping Networks Under Control

By Rudolf Strobl

The continuing evolution of multivendor environments, the explosive proliferation of personal computers and end-user computing and the divestiture of AT&T (giving users many more communications options) are catalyzing the growth and increased complexity of data communications networks. These developments have created a need for alternatives to routine functions such as monitoring, fault isolation and equipment restoration as well as automatic network reconfiguration.

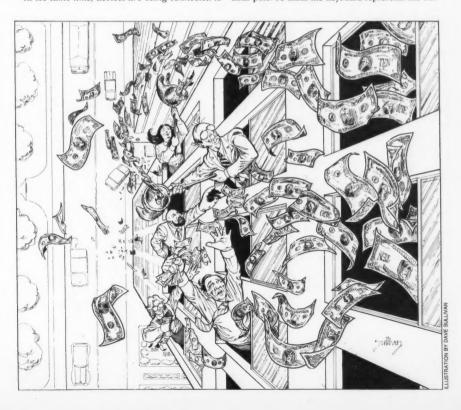
At the same time, devices are being connected to

networks at a pace that far exceeds the ability of the organization to maintain such devices.

Products that enhance network management will comprise 15% to 30% of total systems cost in the not-too-distant future.

The following article is based upon research done by the Yankee Group and published in a report titled Network Management and Diagnostics.

End users do not have the time or the inclination to worry about what is going on behind the communications port. To them the keyboard represents the net-



work. Their primary concern is the ease of accessing information. The network and its functions must therefore appear completely transparent to users. Networking is becoming the key to information management among the diverse groups of users seeking access to corporate information resources. Thus, network management functions should support both hardware (computers, modems and front-end processors) and software (for applications and network control programs as well as accessmethod software in host CPUs). In other words, network management facilities should reside in all network components.

Although it is not a technical discipline, network management is a complex and far-encompassing discipline which covers every physical and logical object or component of the network, starting at the keyboard and extending to the applications programs. It encompasses both the communications element of the network and the data processing system (meaning terminals and central processors). It involves facilities that are needed in support of more complex functions such as network information and software management. These functions are necessary due to the fragmentation and dispersion of the "terminal/program/ data" elements from single to multiple computer environments.

network information management software is available. but it is not available for all the components that have to be integrated in the network. IBM has incorporated all these concepts in its Systems Network Architecture (SNA) as well as some of the software that will control these processes. However, the functionality in terms of supporting certain types of applications such as file transfer are not vet fully developed. For example, SNA lacks an interactive file transfer capability.

Instead of the applications hardware and software controlling the network, the specific network software will control access to the applications and the types of applications. This is based on the presumption that at the moment a device is connected to the network it actually becomes a part of the network. Users should therefore evaluate all network components in terms of their ability to complement control and management functions.

The potential for the network information management market is very large and there are a great deal of opportunities to be exploited by independent data communications equipment systems vendors as well as by IBM. Yet the market has not been fully realized by vendors other than modem manufacturers and a few companies who have been and are currently dominating the opportunities for stand-alone line-diagnostic facilities.

Undoubtedly, the only realistic solution is centralized control supported by decentralized functions resident in every physical and logical network component, enabling a central problem-determination data base to be maintained and used for performance evaluation, capacity planning and other related activities. Characteristic of this approach is network management and control via a network architecture, with SNA coming closest to the optimal solution. The Yankee Group survey found that by the end of 1983, 60% of IBM's largesystem users worldwide will have implemented some form of SNA.

Network management, from an architectural perspective, has an objective that goes beyond establishing and managing a communications link between two processors. True communication takes place only when the application process at either end of a connection are making meaningful exchanges of information.

Network and computer systems vendors, therefore, have had to implement their own architectural strategies to satisfy their users' current networking requirements hence the creations of SNA, Digital Equipment Corp.'s Decnet, Data

General Corp.'s Zodiac and Honeywell, Inc.'s Distributed System Architecture.

With the exception of IBM, most of these vendors have attempted to parallel what they perceive will be the direction of the open systems interconnect (OSI) model, but since only three of the seven layers of the OSI model have been fully specified, vendors are essentially flying in the dark, trying to match what they think will be the eventual standards.

Independent data communications equipment vendors of computer terminal and communications equipment need to follow different approaches to provide both solutions that can integrate the components into the SNA strategy, and imaginative products that can improve their capabilities over competitors.

Even if IBM's integrated approach is chosen by user organization - meaning Communications Network Management (CNM) with all its strategic structure of program products such as Network Communications Control Facility (NCCF), Network Problem Determination Application (NPDA), Network Program Analyzer (NPA) and so on — opportunities remain open for other vendors to promote their own network management solutions and products, which can be as or more sophisticated than currently available IBM offerings. In fact, the unique architecture and flavor of each distributed computer operating environment requires tailored, product-oriented network management support for remote maintenance, performance analysis and console management. Consequently, a good market exists for non-IBM vendors with good network management prod-

To demonstrate the current value of the total communications network management market, an examination of IBM's line of network management facilities currently available for the various network components should be made. These include:

#### PERCENTAGE THAT CNM FUNCTIONS ABSORB IN NETWORK COMPONENTS

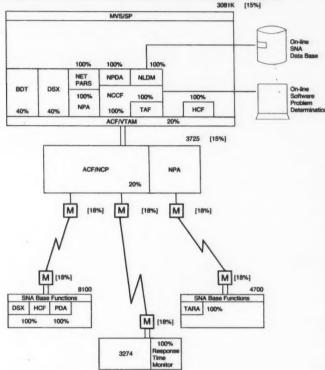


Figure 1

Chart Courtesy of The Yankee Group

- Host-based Communications
   Network Management products.
- Distributed systems based CNM products.
- Diagnostic facilities in modem equipment.
- Network management functions in the 3705 and 3725 communications controllers and other components.

Since dollar figures for the cost of network management are not officially available from vendors, it is not intended to claim total accuracy but to provide a sense of perspective for the sometimes hidden and often ignored cost of these increasingly critical network functions. Moreover, it includes only the cost of products, not technical support or even the dedicated personnel that are currently required in support of these activities. Users should factor in their own costs to arrive at the total cost of network management. In addition, many one-time charge programs, available to simplify network management functions, are not included in the following figures.

Figure 1, shown above, illustrates the percentages that CNM fa-

cilities absorb in network components - computers, program products and modems. For example, 20% of IBM's Virtual Telecommunications Access Method is allocated to network management because of all the support needed for NCCF. The percentage of diagnostic intelligence in modem equipment (18%) has been calculated from prices of equipment with and without diagnostic capabilities. There is a considerable amount of hardware logic in the 3725 controller to perform self-diagnostics and failure isolation, for

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#### COMMUNICATIONS NETWORK MANAGEMENT CONFIGURATION — HARDWARE AND SOFTWARE FOR A HYPOTHETICAL BANKING ORGANIZATION

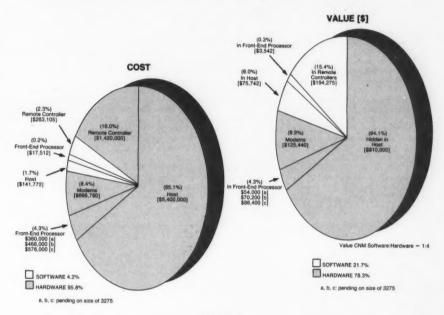


Figure 2

Chart Courtesy of The Yankee Group

both internally and externally attached devices; in addition, the 3725 has a dedicated console for network management functions. Host Command Facility (HCF), which is used in conjunction with Terminal Access Facility (TAF) and allows network operators to control multiple 8100 Distributed Processing Program Executive (DPPX) systems concurrently, as well as Distributed Systems Executive (DSX), which assists users in the managing distributed systems, are both hidden in the operating system of the 8100.

Moreover, in order to have a better grasp of the actual cost of network management facilities, let's create a hypothetical banking organization running one IBM 3081K host computer; two colocated 3725 Communications Controllers (to back up each other), with 70 physical nodes attached consisting of 10 8100 remote controllers, 25 4700 banking controllers, 35 3274 controllers connected through dedicated lines (with 3865 modems transmitting at 9,600 bits/sec).

The 8100 supports some desktop and personal computers, peripherals and so on; the 4700 supports up to 10 terminals and a number of printers; and the 3274 controllers support some display terminals.

Figure 2, shown above, depicts the both the value and the cost of CNM configuration hardware and software for the hypothetical banking organization, and shows that the proportion between the value of CNM software and hardware is 1.4.

The cost pie chart shows the actual cost of CNM configuration hardware and software for the hypothetical banking organization.

Comparison of dollars in the value of CNM configuration hardware and software with dollars in the actual cost of hardware and software configuration yields a percentage of 15.2% — meaning the value of network management hardware and software relative to the actual cost incurred by our banking organization. In other words, CNM facilities represent 15.2% of the actual cost of hardware and network management

program products.

What is the significance of these dollar values and percentages to both users and vendors?

The importance of network management facilities has dramatically increased throughout the last five years. As modem and other line component vendors capitalized on this market with expensive and sophisticated network control centers which only integrate a small percentage of the actual network components, IBM has concentrated and promoted the rather slow but powerful concept of a totally integrated Communications Network Management approach.

During this period of proving their concept, IBM prices remained fairly competitive. The dramatic advantage of a concept that is finally beginning to work will switch the tide toward IBM's integrated approach, but it will also cost users considerably more, even after economies from declining hardware costs have been factored into the total system cost.

While hardware costs will continue to decline relative to software costs, the cost of network management functions will dramatically increase throughout the next three years. In order to continue its annual growth of 15% to 20%, IBM will have to increase the volume of distributed-type hardware sales as well as increase the cost of existing and forthcoming network management systems software.

Projections reveal that total network management systems costs will increase from 15% to 30% or greater as part of total systems costs. This does not include costs of facilities or applications software — such as IMS, Cics, Time-Sharing Option and so forth — which would add an additional 10% to 20% to total system cost. This will bring users increased benefits in terms of network reli-

ability, availability and maintainability and will certainly have an impact in the users' planning of their budgets for network management facilities and services.

For vendors that compete with IBM on a hardware basis, these price developments will provide clues as to how fast IBM can afford to lower its hardware prices. IBM's competitive advantage is partially to offset decreases in hardware prices through both price increases of existing network mangement software program packages and releases of new network control products. IBM's competitors have no comparative advantage unless they can:

 Provide better products in support of their network components within IBM CNM environments.

Compete against CNM applications with user-friendly, easy-to-use CNM products, which can make use of existing CNM data generated by IBM products.

Improve and expand the existing market of line-monitoring equipment.

In recent months, many of the traditional mainframe manufacturers granted SNA a wary approval. Although they continue to shun the notion of direct IBM-compatibility, each of the major mainframe companies, in addition to DEC, Wang Laboratories, Inc. and Hewlett-Packard Co., have formally announced both their intention to support SNA and products that demonstrate each vendor's aggressive program to offer high-level software and communication interconnectability with SNA.

For example, NCR Corp. and Sperry Corp. are developing strategies based on terminal- and clus ter-controller-level software inter-connection conforming to IBM's Physical Unit 2 (PU2) specification of SNA for peripheral nodes and are planning to adopt higher-level

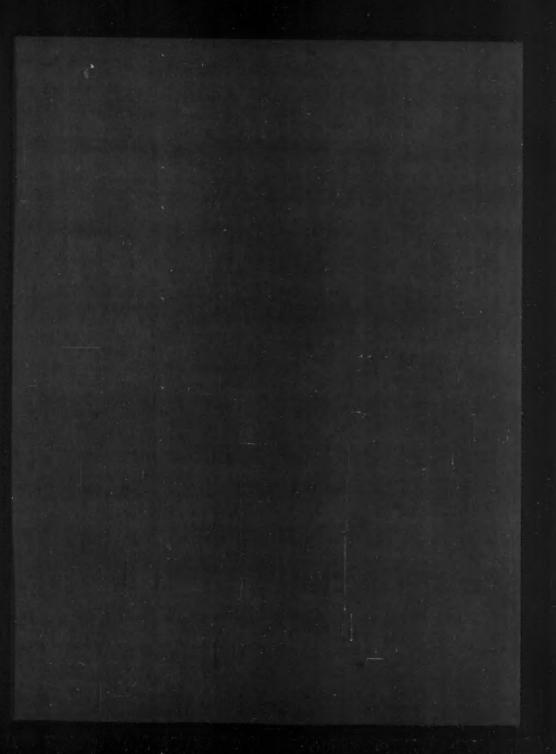
SNA specifications, known as the PU4 and PU5, for their products. These allow communications controllers and host interconnection respectively. The PU4 specification, which represents network control program (NCP) support, has been offered for some time in the NCR Comten product line of IBM-compatible front-end processors.

Similarly, most minicomputer vendors are planning to supply gateways for SNA by the mid-1980s (DEC already does), but the efficiency and ease-of-use of these communications products will depend heavily on cooperation from IBM in supplying interface information at the earliest possible date after the release of new product specifications, systems software and network control software.

Both IBM and other entrepreneurial vendors will also make different alternatives available that will extend the level of connectivbetween computer-driven nodes in SNA networks. For this purpose, the major IBM competitors are developing SNA connectors. The primary function of these products is to provide logical connectability to host-based strategic IBM products, in addition to computer-to-computer functionality currently missing from IBM.

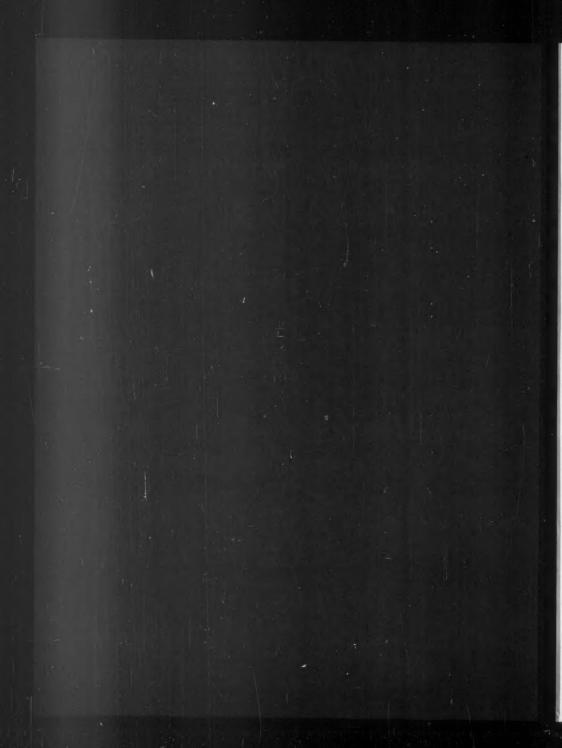
Network management is one of the businesses that have a secure, enormous market. The sheer size of communications networks and their indispensability in every business and government enterprise ensures that network management products will enjoy a dramatic and healthy growth throughout the decade.

Strobl is a senior analyst at the Yankee Group, a Boston-based strategic market planning service. He directs the company's Data Communications Planning Service.



# Maganue

# **VENDOR PROFILES**



A. B. DICK CO.

Office Products 5700 W. Touhy Ave Chicago, IL. 60648 (312) 647-8800 Major Market: Component, Computer, Terminal, Péripheral and Office Equipment Manufacturing: OEM (Computer Systems); Software Target Industries: Education; Government; Legal Target Applications: OA Head of Marketing: Clayton Sokley Geographic Coverage: International

ABLE COMPUTER

1732 Reynolds Ave. Irvine, CA 92714 (714) 979-7030 Major Market: Peripheral and Communications Equipment Manufacturing Head of Marketing: Bob Jones Head of Sales: LaVone Wichman Geographic Coverage: International Year Established: 1975 Number of Employees: 160

ART ASSOCIATES

ABT Microcomputer Software 55 Wheeler St. Cambridge, MA 02138 (617) 492-7100 Major Market: Software House Target Industries: Apple II Target Applications: Communications Head of Marketing: W. Harrington Geographic Coverage: National Year Established: 1982

ACC (ADVANCED COMPUTER COMMUNICATIONS)

720 Santa Barbara St. Santa Barbara; CA 93101 (805) 963-9431 Major Market: Communications Equipment Manufacturing; OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM) Target Industries: Communications Head of Marketing: Don Lavallee Head of Engineering: Ed Fach Year Established: 1976 Number of Employees: 150

ACCESS TELECOMMUNICATIONS

CORP. 60 Shore Dr. Burr Ridge, IL 60521 (312) 920-7920 Major Market: Communications Equipment Manufacturing; Software House Target Industries: Communications; Telecommunications Contacts: Head of Marketing/Sales: Mike Doyle Geographic Coverage: International Year Established: 1982 Number of Employees: 15

ACTION/HONEYWELL 4401 Beltwood Pkwy. S. Dallas, TX 75234 (214) 386-3500 Major Market: Communications Equipment Manufacturing Target industries: Telecommunications **Target Applications: Voice** Networking: Data Network: Message Switching Head of Marketing/Sales: N. Michael

Head of Software/Engineering: Fred Geographic Coverage: National Year Established: 1970 Number of Employees: 300

ADVANCED COMPUTER TECHNIQUES 16 E. 32 St.

Potts

New York, NY 10016 (212) 696-3600 Major Market: OEM (Computer Systems); Software House; Systems House (Commercial OEM)
Target Industries: Banking; Medical; Manufacturing Target Applications: Custom Contacts: Head of Marketing/Sales: Lesley Hersh Geographic Coverage: International Year Established: 1962 Number of Employees: 350

ADVANCED INFORMATION MANAGEMENT

20 Kilby St. Boston, MA 02109 (617) 367-1612 Major Market: Software House Target Industries: Data Processing: Target Applications: Data

Processing; Financial Contacts Head of Marketing/Sales: Michael Head of Software: Edward Tighe

Geographic Coverage: National Year Established: 1978 Number of Employees: 75

ADVANCED MICRO **TECHNIQUES** Suite 209

1291 E. Hillsdale Blvd. Foster City, CA 94404 (415) 349-9336 Major Market: Software House Net Sales: \$100,000 - \$500,000 (1981) Contacts: Head of Marketing: Jack D. Coplen Head of Software: Ed L. Bank Geographic Coverage: International Year Established: 1977

ADVANCED SOFTWARE PRODUCTS, INC. 100 F. Linton Blvd

Tower B Deiray Beach, FL 33444 (305) 276-5080 Major Market: Software House; Systems House (Commercial OEM) Net Sales: \$1 Million - \$5 Million (1981)Contacts: Head of Marketing: A. Oliveri Geographic Coverage: International Year Established: 1976 Number of Employees: 12

ADVANCED SYSTEMS CONCEPTS, INC.

22 Hudson Place Hoboken, NJ 07030 (201) 798-6400 Major Mark et: Software House Target Industries: Bankings; Commercial; Engineering; Education Target Applications: DEC-IBM Communications Contacts: Head of Marketing: Joseph Affrunti Head of Sales: Benjamin Rosenberg Head of Software/Engineering: David Schwartz Geographic Coverage: International Year Established: 1981 Number of Employees: 10

**AETNA TELECOMM LABS** 131 Flanders Road Westboro, MA 01581 Major Market: Component and

Communications Equipment Manufacturing Target industries: Telecommunications Target Applications: Nonspecific Head of Marketing/Sales: Marjorie Katz Head of Engineering: Leon Woo Geographic Coverage: International Year Established: 1981 Number of Employees: 50

AGILE CORP. Building E

2290 Ringwood Ave. Concord, GA 94520 (800) 538-1634 Major Market: Component, Terminal, Peripheral and Communications Equipment Manufacturing
Target Industries: IBM Mainframe
Owners; Fortune 1450 Target Applications: 3270 Net Sales: \$1 Million - \$5 Million (1981) Geographic Coverage: International Year Established: 1977 Number of Employees: 31

AIR LAND SYSTEMS CORP.

2710 Prosperity Ave. Fairfax, VA 22031 (703) 573-1100 Major Market: Component Manufacturing; Software House Contacts: Head of Sales/Marketing: Bill Axe Geographic Coverage: International Year Established: 1970 Number of Employees: 30

Washington St. Westboro, MA 01581 (617) 366-8851 Major Market: Peripheral and Office **Equipment Manufacturing** Target Industries: Meteorology; Banking Contacts: Head of Marketing/Sales: Lawrence Head of Engineering: Charles Willingham Geographic Coverage: National Year Established: 1946 Number of Employees: 120

ALDEN ELECTRONICS, INC.

ALPHA SYSTEMS LTD.

316 N. Michigan Ave. (312) 346-0707 Major Market: Software House; Systems House (Commercial OEM); Dealer/Distributor Target Industries: Legal: Accounting Business Services Target Applications: Accounting; Legal Billing; Communications; Word Processing Net Sales: \$500,000 - \$1 Million Geographic Coverage: Regional Year Established: 1979 Number of Employees: 8

ALPHAMATRIX, INC. 1021 Millcreek Dr. Feasterville, PA 19047 (215) 355-3297 Major Market: Communications Equipment Manufacturing; Software Target industries: Communications; Pharmaceutical; Banking; Insurance Target Applications: Process Control Net Sales: \$500,000 - \$1 Million (1981) Contacts Head of Software: Vince Judith

Geographic Coverage: National Year Established: 1973 Number of Employees: 14

ALSPA COMPUTER, INC.

477 Division St. Campbell, CA 95008 (408) 370-3000 Major Market: Computer Manufacturing Target Industri es: System Integrators; OEMS Target Applications: Medical; Dental Billing; POS Contacts: Head of Marketing/Sales: Richard Head of Engineering: Bill Streeper Head of Customer Service: Dennis Hennina Geographic Coverage: International Year Established: 1980

ALTERGO PRODUCTS, INC. Suite 6900 400 W. Cummings Park Woburn, MA 01801 (617) 938-8811 Major Market: Software House

Target Industries: IBM users Geographic Coverage: National Year Established: 1981 Number of Employees: 12

THE ALTERNATE SOURCE 704 North Penn Ave. Lansing, MI 48906 (517) 482-8270

Major Market: Software House Geographic Coverage: National Year Established: 1980 Number of Employees: 4

AMDAHL CORP 1250 E. Arques Ave. P.O. Box 470 Sunnyvale, CA 94086 (408) 746-6000 Major Market: Component, Computer, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems); Software House Densine/Distributor Target Applications: Project Contacts Head of Software: Fredrick M. Trapnell, Jr. Head of Engineering: Bruce O'Beebe Geographic Coverage: International Year Established: 1970

AMDAHL CORP.
Amdahl Communications Systems Division
Divis

Number of Employees: 5,500

Contacts: Head of Sales: Owen Frances Geographic Coverage: International Year Established: 1969 Number of Employees: 700

AMERICAN COMPUTER & ELECTRONICS CORP.

Suite 242 2 Professional Dr. Gaithersburg, MD 20879 (301) 258-9850 Major Market: Peripheral Manufacturing; OEM (Computer Systems); OEM (Peripherals-Terminals): Software House: Systems House (Commercial OEM); Data Services (Service Bureau) Target Industries: Military: **Telecommunications** Target Applications: Special Military Equipment; Office Automation; Telephone Automation Net Sales: \$1 Million - \$5 Million Conte Head of Marketing: Ron Trowbridge Head of Sales: Dave Ercole Head of Software: Kim Richeson Head of Engineering: Bill Keys Head of Customer Service: George

Geographic Coverage: International

Year Established: 1965 Number of Employees: 100

AMERICAN LASER SYSTEMS,

106 James Fowler Road Golete CA 93117 (805) 967-0423 Major Market: Component and Communications Equipment Manufacturing **Target Applications: Data** Transmission; Video Transmission Net Sales: \$500,000 - \$1 Million (1982)Contacte Head of Marketing/Sales: L. Shallenberger Head of Engineering: Robert Lewis Head of Customer Service: Robert Klemovec Geographic Coverage: International Year Established: 1968 Number of Employees: 22

AMERICAN PHOTONICS, INC.
71 Commerce Road
Brookfield, CT 08804
(203) 775-8950
Major Market Communications
Equipment Manufacturing
Target Industries: Data
Communications;

Contacts: Head of Merketing: Scott Siderman Geographic Coverage: International Year Established: 1981 Number of Employees: 20

AMERICAN TELECOM, INC.

3190 Miraloma Ave.
Anaheim, CA. 92806
(714) 850-7721
Mejor Market: Communications
Equipment Manufacturing
Target Industries: Hotel; Motel
Constacts:
Head of Sales: John Combs
Head of Engineering: Allan
Thompson
Geographic Coverage: International

AMNET, INC.

Year Established: 1976

Number of Employees: 400

P.O. Box 412 101 Morse St. Watertown, MA 02172 (617) 923-1850 Major Market: Component and Communications Equipment Manufacturing; Software Hous Systems House (Commercial OEM) Target Industries: Banking: Service Bureaus: Insurance: Goverment Target Applications: Private Data work; Payroll; Pay-By-Phone Net Sales: \$1 Million - \$5 Million (1981) Head of Marketing/Sales: John S. Whelan Head of Software: Peter Cole Head of Engineering: Richard Pepe Geographic Coverage: International Year Established: 1969 Number of Employees: 75

AMTELCO
8025 Monona Dr.
Madison, WI 53716
(809) 221-3856
Major Market: Communications
Equipment Manufacturing: OEM
(Computer Systems); Systems
House (Commercial OEM)
Target Industries: Answering
Service

Target Applications: Operator and Answering Service Contacts: Head of Marketing: Bernard Torviki Geographic Coverage: International Year Established: 1974 Number of Employees: 130

AHASAZI
2219 E. University Dr.
Phoenix, AZ 85034
(602) 275-0302
Major Market: Communications

Equipment Manufacturing; Software House Terget Industries: Lodging; Banking; Cable TV Contacts: Head of Marketing: Elaine Omburg Head of Engineering: Jan Wiodarkiewicz

Head of Customer Service: Tom Burns Geographic Coverage: International Year Established: 1980

Number of Employees: 65

ANCHOR AUTOMATION, INC.

6913 Valjeun Ave.
Van Nuys. CA. 91406
(213) 997-6493
Meljor Merket: Communications
Equipment Manufacturing
Target Industries: Rotali
Contacts:
Head of Marketing: Bert Weiss
Head of Solvare: Brian Uich
Head of Engineering: Jim Meador
Geographic Coverage: National
Year Established: 1979

Number of Employees: 40

AHDERSON JACOBSON, INC. 521 Charcot Ave. 521 Charcot Ave. 521 Gardon Charcot Ave. 521 Gardon Charcot C

Seppeler Geographic Coverage: International Year Established: 1967 Number of Employees: 875

APEX TECHNOLOGY

10965 N. 5900 W. Highland, UT 84003 (801) 350-8672 Major Market: Communications Equipment Manufacturing Target Industries: Banking; Insurance Contacts: Head of Marketing/Engineering: Mike Stanford Geographic Coverage: National Year Established: 1982 Number of Employees: 4

APPLIED CYBERNETICS, IMC.
224 Carrino Del Cerro
Los Gatos, CA 95030
(415) 651-3000
Major Market: Software House
Target Industries: Manufacturing;
Programming
Contacts:
Head of Marketing: Douglas Hulme
Geographic Coverage: International
Year Established: 1977

Number of Employees: 2

APPLIED DATA RESEARCH,
INC.

Reu. 206
Orchard Road
Orchard Road
Orchard Road
Orchard Road
Orchard Road
Reinest Software House
Contacts:
Head of Marketing: Donald A. Jordon
Head of Software: Martin A. Goetz
Geographic Coverage: International
Year Established: 1959
Number of Employees: 825

APPLIED INFORMATION

BYSTEMS, INC.

500 Eastowne Dr.

Chapel Hill, NC 27514

(919) 942-7850 ftware House

Hagin Market: Software House

Target Applications: Compilers

(PL/1): Data Entry; Word Processing;

Communications

Net Sales: \$100,000 - \$500,000

(1981)

Contacts:
Head of Marketing: Elizabeth

Epermanis

Geographic Coverage: International

Year Established: 1972

Humber of Employees: 7

APPLITEK CORP.

107 Audubon Road
Wakefield, MA 01880
(617) 246-4500
Major Markete Communications
Equipment Manufacturing; Software
House
Terget Industries: Government;
Scientific: Universities
Terget Applications:
Communications
Contacts:
Communications
Contacts:
Head of Software: Patricia Elliot
Head of Customer Service: Dale
Hokanson
Geographic Coverage: National
Year Established: 1982
Number of Employees: 40

ARBAT SYSTEMS LTD.
5 Marine View Plaza
Hoboken, NJ 07030
(212) 269-1300
Major Market: Software House;
Systems House (Commercial OEM);
Data Services (Service Flurau)

Smoot

Contacts Head of Marketing: Christopher Manderson Head of Sales: Mark Lobene Geographic Coverage: International Year Established: 1975 Number of Employees: 110

ARK ELECTRONIC PRODUCTS, INC. 325 W. Hibiscus Blvd. Melbourne, FL 32901 (305) 724-5260

Major Market: Communications **Equipment Manufacturing** Head of Marketing/Sales: Gayle Lucas Head of Software/Engineering: P.W. Schirmer

Geographic Coverage: International Year Established: 1972 Number of Employees: 150

### ARTEL COMMUNICATIONS CORP.

P.O. Box 100 W. Side Station Worcester, MA 01602 (617) 752-5690 Major Market: Communications Equipment Manufacturing Target Industries: Government; Television Networks: Computer Graphics Target Applications: CAD/CAM; Transmission of Video/Audio; Digital Data Contacts Head of Marketing: Harry Jain Head of Sales: John Bielawski Head of Engineering: Russell Patterson Geographic Coverage: International Year Established: 1980 Number of Employees: 40

ASHTON, INC. 209 Tracy Creek Road Vestal, NY 13850 (607) 748-0600 Major Market: Software House Geographic Coverage: National Year Established: 1969 Number of Employees: 9

### AST RESEARCH, INC.

2121 Alton Ave. Irvine, CA 92714 (714) 863-1333 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Banking; Communications; OA; IBM PC users Contacts: Head of Marketing: Tom Yuen Head of Sales: Tom Stickel Head of Engineering: Albert Wong Geographic Coverage: International Year Established: 1980 Number of Employees: 167

ASTROCOM CORP. 120 W. Plato Blvd. St. Paul, MN 55107 (612) 227-8651 Major Market: Component, Computer and Communications **Equipment Manufacturing** Head of Marketing/Sales: Kent Johnson Head of Software: Michael Anderson Head of Engineering: Don Kaffein Geographic Coverage: International Year Established: 1968 Number of Employees: 150

ATARL INC. P.O. Box 427 1265 Borregas Ave. Sunnyvale, CA 94 94086 (408) 745-2000 Major Market: Computer Manufacturing; OEM (Computer Systems); Software House Target Industries: Personal Computer; Education Target Applications: Educational; General Business; Games Contacts Head of Marketing: Tom McDonough

Head of Engineering: Marcian E. Hoff Geographic Coverage: International Year Established: 1972 Number of Employees: 6,000

## ATLANTIC RESEARCH CORP.

5390 Cherokee Ave. Alexandria, VA 22312 (703) 644-9190 Major Market: Communications Equipment Manufacturing Target Industries: Fortune 1000; Banking; Manufacturing Target Applications: Data Communications Head of Marketing: Keith Britton Head of Sales: Daniel Ebert Head of Engineering: J.L. Wallace Geographic Coverage: International Year Established: 1949 Number of Employees: 1,800

ATON INTERNATIONAL, INC. Suite 119 1765 Scott Ave. 95050 Santa Clara, CA (408) 554-9922 Major Market: Software House Geographic Coverage: International Year Established: 1978 Number of Employees: 2

### AUSCOM, INC.

2007 Kramer Lane Austin, TX 78758 (512) 836-8080 Major Market: Communications **Equipment Manufacturing** Target Industries: Systems Integrators Net Sales: \$1 Million - \$5 Million (1981)Contacts Head of Marketing: Linda Lewis Head of Engineering: Iraj Vojdani Geographic Coverage: National Year Established: 1980 Number of Employees: 15

ATAT INFORMATION SYSTEMS, INC. 100 Southgate

Morristown, NJ 07960 (201) 898-2000 Major Markets: Communication Equipment Manufacturing Target Industries: Communication
Target Applications: Switching
Contacts: Head of Marketing/Sales: Robert Casa Head of Customer Service: Bruce

Geographic Coverage: International

# **AUTOMATED BUSINESS**

Suite 108 10205 Oasis Dr. San Antonio, TX 78216 (512) 349-3190 Major Market: Software House; Data Services (Service Bureau): Dealer/Distributor Net Sales: \$500,000 - \$1 Million (1982)Contacts: Head of Sales/Marketing: Fred Geographic Coverage: National Year Established: 1969 Number of Employees: 15

AUTOMATED BROFFERINAL

# SYSTEMS

1450 Broadway NY 10018 (212) 869-9330 Major Market: Computer Manufacturing: Software House Head of Marketing: Doug Sharp Head of Sales: Don Thompson Geographic Coverage: International Year Established: 1978 Number of Employees: 14

# AUTOMATION DESIGN, INC.

500 N. Michigan Ave. Chicago, IL 60 (312) 670-2660 60611 Major Market: Software House Target Industries: Finance; Medical Contacts Head of Customer Service: Peter Geographic Coverage: National Year Established: 1978 Number of Employees: 27

# **AVANTI COMMUNICATIONS** CORP. Aquidneck Industrial Park

Newport, RI 02840

(401) 849-4660

Major Market: Communications Equipment Manufacturing Target Applications: Local Data Communications Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: George Kushin Head of Sales: William Smith Head of Engineering: Paul Fredette Head of Customer Service: Wayne Geographic Coverage: International Year Established: 1976 Number of Employees: 88

### AVATAR TECHNOLOGIES,

99 South St. Hopkington, MA 01748 (617) 435-6872 Major Market: Communications Equipment Manufacturing **Target Applications:** Communications Head of Marketing: Daniel Lewis Geographic Coverage: National Year Established: 1981 Number of Employees: 70

AVCOM, INC. 275 Smothers Road Westerville, OH 43081 (614) 882-8176 Major Market: Communications Equipment Manufacturing; Year Established: 1970

Number of Employees: 3

A. W. COMPUTER SYSTEMS, INC.

Woods Road Rt. 38 Cherry Hill, NJ 08002 (609) 779-7200 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems); Syste House (Commercial OEM): Miscellaneous Computer Supplies Target Industries: Retail
Target Applications: POS; Realtime Inventory Net Sales: \$1 Million - \$5 Million (1981)Contacts: Head of Marketing: Di Simone Head of Software: Mike Greenblatt Head of Engineering: Charles Welch Head of Customer Service: Andy Nve Geographic Coverage: International Year Established: 1973 Number of Employees: 17

## **BACKUS DATA SYSTEMS**

1440 Koll Circle San Jose, CA 95112 (408) 279-8711 Major Market: Communications Equipment Manufacturing; Dealer/Distributor Target Applications: Protocol Emulation Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: A. W. Backus Head of Software/Engineering: L. Geographic Coverage: National Year Established: 1974 Number of Employees: 20

### BARR SYSTEMS, INC.

Suite 315 2500 Blue Ridge Road Raleigh, NC 27607 (919) 782-4462 Major Market: Software House Net Sales: Less than \$100,000 Contacts: Head of Marketing/Sales: Anthony J. Geographic Coverage: International Year Established: 1978 Number of Employees: 3

BASIC BUSINESS CONTROL SYSTEMS, INC.

4330 Stafford S.W. Grand Rapids, MI 49508 (616) 531,2202 Major Market: Software House; Systems House (Commercial OEM); Dealer/Distributor Target Industries: Retail; Commercial; Government; Education Target Applications: POS

Head of Sales: Michael Goodyeer Geographic Coverage: Michigan Year Established: 1961 Number of Employees: 20

## BASS SNEED ASSOCIATES,

P.O. Box 646 20 W. Ridgewood Ridgewood, NJ 07450 (201) 444-3411 Major Market: Software Hous Systems House (Commercial OEM) Target Industries: Military; Industrial: Commercial Net Sales: \$100,000 - \$500,000 (1981) Geographic Coverage: Greater New **Vort** Year Established: 1980 Number of Employees: 5

### BAY TECHNICAL ASSOCIATES, INC.

P.O. Box 387 Highway 603 Bay St. Lois, MS 39520 (601) 467-8231 Major Market: Communications Equipment Manufacturing Target Applications: Data Communications Contacts: Head of Marketing: E. Hayden Parker Head of Sales: C.R. Ram Head of Engineering: M.R. McIver Year Established: 1974 Number of Employees: 25

# BIBM COMMUNICATIONS

Information Management Systems 70 Fawcett St. Cambridge, MA 02238 (617) 491-1850 Major Market: Communications Equipment Manufacturing; Software House; Consulting Target Industries: Manufacturing; Insurance **Target Applications: Data** Communications Contacts: Head of Marketing: Chuck Stein Head of Sales: Terry Fagin Head of Software: Robert Harvey Geographic Coverage: National Year Established: 1980

### BELDEN CORP.

Cooper Industries 2000 S. Batavia Ave. Geneva, IL 60134

(312) 232-8900 Major Market: Communications Equipment Manufacturing Contacts Head of Marketing: Jim Sopp Geographic Coverage: National Year Established: 1902 Number of Employees: 1,000

BENSON C. STONE & ASSOCIATES

P.O. Box 28658 San Diego, CA 92127 (714) 485-7779 lajor Market: Software Hous Net Sales: \$100,000 - \$500,000 (1981)Geographic Coverage: National Year Established: 1975 Number of Employees: 5

BETACOM CORP. 245 E. Sixth St.

Suite 814 St. Paul, MN 55101 (612) 292-8188 Major Market: Computer and Communications Equipment Manufacturing Target industries: insurance; Legal; Rusiness Head of Marketing: Bill Presley Head of Sales: John Zentz Head of Software: Jerry Thornbeck Head of Engineering: Al Nuendorf Geographic Coverage: International Year Established: 1979 Number of Employees: 24

BIZCOMP

532 Waddell Dr. Sunnyvale, CA 94089 (408) 745-1616 Major Market: Communications **Equipment Manufacturing** Contacts Head of Marketing: Bruce Miller Head of Sales: Peter Stokes Year Established: 1978 Number of Employees: 100

BLACK BOX CATALOG/ EXPANDOR, INC.

Mayview Road Park Dr. Pittsburgh PA 15241 (412) 746-5500 ajor Market: Communications **Equipment Manufacturing** Head of Marketing: Peter Highberg Geographic Coverage: International Year Established: 1976

BO-SHERREL CO., INC. 36133 Niles Blvd. Fremont, CA 94536 (415) 792-0354 Major Market: Peripheral and Communications Equipment Manufacturing Net Sales: \$1 Million - \$5 Million (1982) Contacts Head of Marketing: Carlene L. Rathert Geographic Coverage: International Year Established: 1975 Number of Employees: 10

SONNECAZE, MCLERCY & HARRISON

Suite 112 4125 Keller Springs Road Dallas, TX 75234 (214) 484-0530 Major Market: Software House Net Sales: \$100,000 - \$500,000 Geographic Coverage: international Year Established: 1978 Number of Employees: 6

BRAEGEN CORP.

MITTS 525 Los Conches St. Milpitaso, CA (408) 945-1900 Major Market: Terminal, Peripheral and Communications Equipment Manufacturing; Automatic Tape Target Industries: Financial; Government: Insurance: Manufacturing Head of Sales: Ray Foster Head of Software: Peggy Dent Head of Engineering: Ken McCoy Geographic Coverage: National Year Established: 1973 Number of Employees: 500

ROADBAND SYSTEMS, INC. 807 Grundy Ave.

Holbrook, NY 11741 (516) 981-4613 Major Market: Communications Equipment Manufacturing; Systems House (Commercial OEM); Consulting, Communications Target Industries: Banking: Engineering Target Applications: Local Area Networks; CAD/CAM; Microwave Communications, Fiber-Optic Communications Net Sales: \$500,000 - \$1 Million Geographic Coverage: National Year Established: 1978 Number of Employees: 25

SUMBLEBSE ENERGY SYSTEMS 456 W. State St.

Trenton, NJ 08618 (609) 392-1200 Major Market: Component, Computer and Communications Equipment Manufacturing; Software Target Industries: Energy Management: Housing: Large **Apartment Complexes** Target Applications: Energy Management: Process Control Head of Marketing: Hy Gold Head of Software: Mike Linkebloom Head of Engineering: Chip Bloodgood Geographic Coverage: Regional Year Established: 1981 Number of Employees: 10

BURROUGHS CORP.

**Business Machines Groups** Burroughs Place Detroit, MI 48232 (313) 972-7000 Major Market: Component. Computer, Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing: OEM (Computer Systems): Software House; Data Services (Service Bureau); Dealer/Distributor Target Industries: Financial: Distribution: Manufacturing: Education Geographic Coverage: National Year Established: 1885

BURROUGHS CORP.

**Burroughs Place** Detroit, MI 48232 (313) 972-7000 Major Market: Computer. Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems); Software House; Dealer/Distributor Target Industries: Government; OA; Office Supply; Finance Geographic Coverage: International Year Established: 1885 Number of Employees: 62,000

BYTCOM, INC.

2169 Francisco Blvd. San Rafael, CA 94901 (800) 227-3254 Major Market: Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Data Services (Service Bureau) Target industries: Banking; Timesharing Services; Dealers and Distributors; PC users Target Applications: Data Compression; Modern; Multiplexer; Protocol Converting Head of Marketing: Gary Sorkin Year Established: 1983 Number of Employees: 150

BYTEX CORP.

2 California Ave Framingham, MA 01701 (617) 879-5050 Major Market: Communications **Equipment Manufacturing** Target Industries: Transportation; Banking: Network Services Net Sales: Less than \$100,000 Contacts Head of Sales: Ralph W. Lowry Head of Software: Bang-Woel Lu Head of Engineering: Kenneth Holberger Head of Customer Service: Glenn Hill Geographic Coverage: International Year Established: 1980 Number of Employees: 60

C & W INCOTEL LTD.

48th Floor 110 Penn Plaza New York, NY 10119 (212) 594-8340 Major Market: Software House; Systems House (Commercial OEM)
Target Industries: Banking; Airlines; Shipping; Military
Target Applications: Storm
Forecasts; Message Switching Contacts Head of Marketing/Sales: John Head of Engineering: Larry Reznick Geographic Coverage: International Year Established: 1970 Number of Employees: 40

### CABLEBUS SYSTEMS CORP. 7869 S. W. Nimbus

Beaverton, OR 97005 (503) 643-3329 Major Market: Communications Equipment Manufacturing Target Industries: Communications: Contacts: Head of Marketing: David Park Head of Engineering: Mike Connor Geographic Coverage: International Year Established: 1979 Number of Employees: 25

### **CANOGA DATA SYSTEMS**

21218 Van Owen St. Canoga Park, CA 91303 (213) 888-2003 Major Market: Communications Equipment Manufacturing Target Industries: Communication Target Applications: Multiplexing Contacts: Head of Sales: Jack Miller Head of Engineering: Mas NaKamori Geographic Coverage: International Year Established: 1978 Number of Employees: 110

## CANON U.S.A., IHC.

One Canon Plaza Lake Success, NY 11042 (516) 488-6700 Major Market: Computer, Peripheral and Office Equipment Manufacturing; OEM (Computer Systems); Systems House (Commercial OEM) Geographic Coverage: International Year Established: 1966 Number of Employees: 2,500

## CAP INFORMATION SYSTEMS

34th Floor 521 Fifth Ave New York, NY 10175 (212) 599-7000 Major Market: Software House Target Industries: Banking: Manufacturing; Retail Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Bernard S. Donefer Head of Sales: Andrew Coleman Head of Customer Service: Roy Kiszka Geographic Coverage: International Year Established: 1979 Number of Employees: 60

# CARNEY ASSOCIATES, INC. 6000A W. Broad St.

Richmond, VA 23230 (804) 288-8341

Major Market: Software House; Systems House (Commercial OEM) Target Industries: Retail Fashions Target Applications: Remote Job Entry; Hand-held Data Entry; POS;

Communications Networks Net Sales: \$500,000 - \$1 Million (1981)Contacts

Head of Marketing: Homer C. Carney Head of Software: R. R. Gingras Geographic Coverage: Regional Year Established: 1977 Number of Employees: 10

### CATEL United Scientific Corp.

4800 Patrick Henry Dr. Sente Clara, CA 95054 (408) 988-7722 Major Market: Communications Equipment Manufacturing Target industries: Data Communications: Military: Telephone; Cable TV Contacts: Head of Marketing: Jim McLane Head of Sales: Dick Old Head of Engineering: Charles Robidari Head of Customer Service: J. R. Helmer

# Geographic Coverage: International Year Established: 1968 Number of Employees: 200 CENTURY ANALYSIS, INC.

114 Center Ave. Pacheco, CA 94553 (415) 680-7800 Major Market: OEM (Computer Systems); OEM (Peripherals Terminals); Software House Target Industries: General Marketing Head of Marketing: Clayton L. Parkhill Head of Customer Service: Frank Zaccari Geographic Coverage: International Year Established: 1975 Number of Employees: 60

### CERMETEK MICROFLECTRONICS

1308 Borregas Ave. Sunnyvale, CA 94089 (408) 734-8150 Major Market: Component and Communications Equipment Manufacturing Head of Marketing: Nancy Hass Head of Sales: Rene Colgate Year Established: 1963 Number of Employees: 100

### CHI CORP.

26055 Emery Road Cleaveland, OH 44128 (216) 831-2622 Major Market: Terminal and Communications Equipment Manufacturing; OEM (Computer Systems); Systems House (Commercial OEM); Data Services (Service Bureau)

Head of Marketing: Maurice Kittle Geographic Coverage: International Year Established: 1976 Number of Employees: 24

TELECOMMUNICATIONS Suite 30 450 San Antonio Palo Alto, CA 94306 (415) 8582456 Major Market: Communications **Equipment Manufacturing** Target Industries: Data Communications Contacts Head of Marketing/Sales: May Chung Year Established: 1982 Number of Employees: 100

### CINCOM SYSTEMS, INC. 2300 Montana Ave. Cincinnati, OH 45211

(513) 662-2300 Major Market: Software House Target Industries: Cross Industry Target Applications: Data Base/Data Communications; Manufacturing: Financial Contacts: Head of Marketing/Sales: Dennis Yabionsky Geographic Coverage: International Year Established: 1968

# Number of Employees: 1,000 CISINETWORK

3401 Science Center Philadelphia, PA 19104 Major Market: Software House; Data Services (Service Bureau) Target Industries: Finance; Education: Government Geographic Coverage: National Year Established: 1972 Number of Employees: 125

### COASTCOM 2312 Stanwell Drive

Concord, CA 94520 (415) 825-7500 Major Market: Component Manufacturing; Communications Equipment Manufacturing
Target Industries: Telephone;
Radio; Telecommunications Target Applications: Voice/Data Contacts Head of Marketing/Sales: William Head of Engineering: Toney Warren Head of Customer Service: Paul Rivard Geographic Coverage: International Year Established: 1969 Number of Employees: 95

## CORE CORP.

2001 W. Beltline Highway Madison, WI 53713 (608) 274-7416 Major Market: Software House Systems House (Commercial OEM) Target Industries: Financial Target Applications: DBMS

Head of Marketing: Daphne Brauner Geographic Coverage: National Year Established: 1976 ber of Employees: 25

# CODENDLL TECHNOLOGY

1086 N. Broadway Yonkers, NY 10701 (914) 965-6300 Major Market: Communications Equipment Manufacturing Target industries: Telecommunications: Process Control: Communications Contacts: Head of Marketing/Sales: Mike Cortor Head of Engineering: Dr. Frederick Scholi Geographic Coverage: International Year Established: 1980 Number of Employees: 50

### CODEX CORP.

20 Cabot Blvd. Mansfield, MA 02048 (617) 364-2000 Major Market: Computer, Terminal, Peripheral and Communications Equipment Manufacturing Target Applications: Data Communications; DP Contacts: Head of Marketing: John Pugh Head of Sales: Dennis Kirsh Geographic Coverage: International Year Established: 1962

# Number of Employees: 2,500 COMERENT COMMUNICATIONS SYSTEMS CORP.

CORP. 60 Commerce Dr. 11788 (516) 231-1550 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: Dennis McAlpine Head of Engineering: Arthur B. Williams Geographic Coverage: international Year Established: 1968 Number of Employees: 150

## COM DATA

7900 N. Nagle Ave. Morton Grove, IL 60053 (312) 470-9600 Major Market: Communications Equipment Manufacturing Head of Customer Service: Sue Geographic Coverage: National Year Established: 1968 Number of Employees: 40

### COM/TECH SYSTEMS, INC.

505 Eighth Ave. New York, NY 10018 (212) 594-5377 Major Market: Communications **Equipment Manufacturing** Head of Marketing: Carl M. Mengani Geographic Coverage: International Year Established: 1969 Number of Employees: 10

### COMPESION, INC. 751 S. Kellog Goleta, CA 93117 (805) 964-9852 Rajor Market: Communications Equipment Manufacturing Contacts Head of Marketing: Arias Schiff Geographic Coverage: International Year Established: 1977

### COMM PRO ASSOCIATES 350 N. Sepulveda Blvd Manhattan Beach, CA 90266 (213) 376-1344 Major Market: Software House Net Sales: \$500,000 - \$1 Million (1981) Contents

Number of Employees: 100

Head of Marketing: Steve Dubow Geographic Coverage: International Year Established: 1973 Number of Employees: 3

### COMMEX, LTD. 141 Central Park Ave. S. Hartsdale, NY 10530 (703) 821-8766 Major Market: Component and Communications Equipment Manufacturing **Target Applications:** Communications Net Sales: \$1 Million - \$5 Million Contacts: Head of Engineering: James Southworth Geographic Coverage: International Year Established: 1980

### Number of Employees: 20 COMMODORE BUSINESS MACHINES, INC.

1200 Wilson Dr West Chester, PA 19380 (215) 431-9100 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing; Software House Contacts: Head of Marketing/Sales: Myrddin Jones Geographic Coverage: International Year Established: 1976 Number of Employees: 520

# COMMTEX, INC.

2411 Crofton Lane 21114 (301) 721-3666 Major Market: Communications Equipment Manufacturing Target Applications: OA Contacts Head of Marketing: George Lockwood Head of Software: Dorothy C. Head of Engineering: Stephen E. Hall Geographic Coverage: International Year Established: 1977 Number of Employees: 75

### COMMUNICATION DEVICES, INC

1 Forstman Court

Clifton, NJ 07011 (201) 772-6997 Major Merket: Communications Equipment Manufacturing; Dealer/Distributor Target Industries: Newspaper: Target Applications: Interfacing and Data: Data Communications Net Sales: \$1 Million - \$5 Million (1982)Contacts Head of Marketing: K. Kelly Head of Software: T. Kelly Head of Engineering: R. Kelly Head of Customer Service: Barbara Grembowiec Geographic Coverage: International Year Established: 1975 Number of Employees: 15

# COMMUNICATION RESEARCH

1720 130th N.E. Bellevue, WA 98005 (206) 881-9550 Major Market: Computer and Communications Equipment Manufacturing; OEM (Peripherals-Terminals) Target Applications: Data Encryption; Data Transmission Head of Marketing: J.J. Harkins Geographic Coverage: National Year Established: 1979 Number of Employees: 22

### COMP-U-STAFF, INC. 1 Investment Place P-4 Towson, MD 21204

(301) 828-0788

Major Market: Software House Systems House (Commercial OEM)
Target Industries: Manufacturing: Engineering; Banking; Insurance Target Applications: Material Handling; CAD/CAM Manufacturing; Banking Net Sales: \$1 Million - \$5 Million Contacts Head of Marketing: Thomas R. Cornell Head of Software: Douglas Sharp Geographic Coverage: International Veer Established: 1978

### COMPION CORP. 1101 E. University Ave.

Number of Employees: 100

Lirbana, IL 61801 (217) 384-8500 Major Market: Software House Target Industries: Government; Banking Contacts Head of Sales: Gary Tauss Geographic Coverage: National Year Established: 1977 Number of Employees: 68

# COMPLEX SYSTEMS, INC.

4930 Research Dr. Huntsville, AL. 35805 (205) 830-4130

Major Market: Communications Equipment Manufacturing Target Applications: Local-Area Networka Contacts Head of Sales: Bill Thomas Head of Engineering: Bayron Driver Year Established: 1982

# Number of Employees: 30 COMPRE COMM, INC. 3200 N. Farber Dr. Champaign, IL 61821 (217) 352-2477

Major Market: Communications Equipment Manufacturing Net Sales: \$1 Million - \$5 Million Contacts Head of Marketing: Ron Sockel Head of Sales/Engineering: Andrew Head of Software: Michael Sacre

Geographic Coverage: International Year Established: 1977 Number of Employees: 40

### COMPU-DRAW 1227 Goler Houser Rochester, NY 14620 (716) 454-3188 Major Market: Software House Target Industries: Small Business Target Applications: Time-Sharing: Protocol Conversion; Mail List Geographic Coverage: National Year Established: 1982

Number of Employees: 6

## COMPUCORP

2211 Michigan Ave. Santa Monica, CA 90404 (213) 829-7453 Major Market: Computer and Office Equipment Manufacturing; Data Services (Service Bureau) Target Industries: Legal; Business Target Applications: WP: Accounting Head of Marketing: S. Cimbolost Geographic Coverage: International Year Established: 1968 Number of Employees: 500

## COMPUTAX SYSTEMS, INC.

7471 University Ave. La Mesa, CA 92041 (714) 462-5420 Major Market: Software House Systems House (Commercial OEM); Data Services (Service Bureau) Contacts: Head of Sales: Don Middleton Geographic Coverage: National

# COMPUTER AUTOMATION,

INC. Commercial Systems Division 1800 Jay Ell Dr. Richardson, TX 75018 (214) 783-0993 Major Market: Computer and Communications Equipment Manufacturing Target Industries: Distribution; End Users Contacts: Head of Marketing: Steve Konarek

Geographic Coverage: International Year Established: 1975 Number of Employees: 200

### COMPUTER COMMUNICATIONS, INC.

2610 Columbia St. Torrance, CA 90503 (213) 320-9101 Major Market: Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems) Contacts Head of Marketing: Gary Brumfield Head of Sales: Robert L. Cole Head of Software: Anthony Fonze Head of Engineering: Carl Vanderbeck Geographic Coverage: International Year Established: 1966

# COMPUTER SPECIALISTS, INC.

Number of Employees: 150

6683 Jimmy Carter Blvd. Norcross, GA 30071 (404) 441-3114 Major Market: Component, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Utilities; Manufacturing; Retail; Wholesale Target Applications: Data Entry; POS Polling; Badge Readers; Bar Code Readers Net Sales: \$1 Million - \$5 Million (1982) Contacts Head of Marketing: Steve A. Head of Software: R. L. Pass Head of Engineering: Dr. Dwight Jones Geographic Coverage: International Year Established: 1977

# Number of Employees: 40

COMPUTER CORNER 22 Beechurst Ave Morgantown, WV 26505 (304) 292-9700 Major Market: Software House; Dealer/Distributor Contacts Head of Marketing: Mike Matz Geographic Coverage: Mid-Atlantic Year Established: 1975 Number of Employees: 15

# COMPUTER DEVELOPMENT,

6700 S.W. 105th Beaverton, OR 97005 (503) 646-1599 Major Market: Communications Equipment Manufacturing Contacts: Head of Sales: Penny Estes Head of Engineering: Gordon Collett Head of Customer Service: Kathy Ferguson Geographic Coverage: National Year Established: 1977 Number of Employees: 70

COMPUTER IDENTICS CORP. 5 Shawmut Board Canton, MA 02021 (617) 821-0830 Major Market: Peripheral Manufacturing; OEM (Computer Systems); Code Scanning Target Industries: Materials Handling; Food Distribution Target Applications: Distribution Management; Production Management; Inventory Control; Data Acquisition Net Sales: \$5 Million - \$25 Million (1982)Contact Head of Marketing: Robert Shallow Head of Software: Theodore Williams Head of Engineering: Chris B. Kansamhalis

# COMPUTER INFORMATION

Head of Customer Service: Richard

Geographic Coverage: International Year Established: 1968 Number of Employees: 110

**ENTERPRISES** 13030 Fuelid Garden Grove, CA 92643 (714) 534-0202 Major Market: Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Applications: WP; Network Communications; Business Software: Retail Net Sales: \$1 Million - \$5 Million (1981) Head of Marketing: Gary Irwin Head of Software: Craig Chandler Geographic Coverage: National Year Established: 1975

## Number of Employees: 8 COMPUTER INQUIRY SYSTEMS, INC.

160 Hopper Ave. Waldwick, NJ 07463 (201) 444-8900 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems); OEM (Peripherals-Terminals) Target industries: Pharmaceutical: Manufacturing Target Applications: Laboratory Automation; Laboratory Management Net Sales: \$1 Million - \$5 Million (1982)Geographic Coverage: International Year Established: 1969 Number of Employees: 45

# COMPUTER PERIPHERAL

SYSTEMS, INC. P.O. Box 98282 Atlanta, GA 30359 (404) 292-9565 Major Market: Communications Equipment Manufacturing; Systems House (Commercial OEM); Dealer/Distributor Target Industries: Burroughs; Data Communications Networks Target Applications: Data

Communications Networks Contacts Head of Marketing: Richard Fetsko Number of Employees: 6

COMPUTER SYSTEMS 26401 Harper Ave. St. Clair Shores, MI 48081 (313) 779-8709 Major Market: Component. Computer and Communications Equipment Manufacturing; OEM (Computer Systems) Target Industries: Industrial; Engineering Target Applications: Graphics; Communications; Control System; Data Acquisition Head of Marketing: Robert Martin Geographic Coverage: National Year Established: 1967

# Number of Employees: 20 COMPUTER TOOLBOX, INC.

1325 E. Main St. Waterbury, CT 06705 (203) 754-4197 Major Market: OEM (Computer Systems); Software House; Dealer/Distributor Target Industries: Programmers
Target Applications: Development Tools: Communications Geographic Coverage: International Year Established: 1979 Number of Employees: 3

# COMPUTERWARE SOFTWARE

2129 Germantown Road S. Memphis, TN 38138 (901) 754-8332 or Market: Software Hous Net Sales: \$100,000 - \$500,000 (1981)Contacts: Head of Marketing: Michael Pfaff Geographic Coverage: International Year Established: 1976 Number of Employees: 5

# COMPUTIME, INC.

Suite 226

401 N. 117th St Omaha, NE 68154 (402) 330-1311 Major Market: Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Industries: Manufacturing: Target Applications: Order Processing; Accounting Contacts: Head of Software: Bob Bohac Geographic Coverage: Regional Year Established: 1978 Number of Employees: 7

# COMPUTROL

15 Eason Allen Highway Ridgefield, CT (203) 544-9371 Aajor Market: Computer and Communications Equipment Manufacturing Contacts:

Head of Marketing: Charles Brewer Head of Sales: John Ricketson Year Entablished: 1971 Number of Employees: 75

### COMPUTEDNICS

130 N. Ash Wood Dale, IL 60191 (312) 860-7707 lajor Market: Software House Net Sales: Less than \$100,000 (1981) Contacts: Contacts: Head of Sales: Deborah Styka Geographic Coverage: International Year Established: 1977 Number of Employees: 4

### COMPUVIEW PRODUCTS

1955 Pauline Blvd. Ann Arbor, MI 48103 (313) 996-1299 Major Market: Software House Target Applications: Text Editing; Disassembler: Telecommunications: Print Buffer Net Sales: \$100,000 - \$500,000 (1982)Contacts: Head of Marketing: John Cain Head of Sales: Brian Howard Head of Software: Jeff Brown Geographic Coverage: International Year Established: 1980 Number of Employees: 12

### COMPUWARE CORP. Systems Software Division

32100 Telegraph Rd. Birmingham, MI 48010 (313) 540-0400 Major Market: Software House Systems House (Commercial OEM) Head of Marketing: Alan B. Cutting Geographic Coverage: International Year Established: 1973 Number of Employees: 350

### COMREX INTERNATIONAL Suite 120

3701 Skypark Drive Torrance, CA 90505 (213) 373-0280 Major Market: Component, Computer, Peripheral and Communications Equipment Manufacturing; OEM (Peripherals Target Industries: Business; Home Contacte Head of Marketing: Robert Pearce Head of Sales: Bill Falkenstein Head of Engineering: Marshall Brown Head of Customer Service: Judy Fuller Geographic Coverage: International Year Established: 1981 Number of Employees: 24

COMSPEC, INC. 10000 Old Katy Road Houston, TX 77055 (713) 461-4487 Major Market: Software House; Systems House (Commercial OEM); Dealer/Distributor

Head of Marketing/Sales: R. W. Irish Head of Software/Engineering: Don Kirld

Geographic Coverage: International Year Established: 1972 Number of Employees: 55

### COMTECH DATA CORP.

350 N. Hayden Road Scottsdale, AZ 85253 (602) 949-1155 Major Market: Communications Equipment Manufacturing; Systems House (Commercial OEM) Target Applications: High-Speed Data Transmission Contacta Head of Marketing: Jerry Rufener Head of Engineering: Bob Fitting Year Established: 1978 Number of Employees: 200

## CONCORD DATA SYSTEMS, INC.

303 Bear Hill Road Waltham, MA 02154 (617) 890-1394 Major Market: Communications **Equipment Manufacturing** Contacts Head of Sales: Steven Puchkoff Head of Engineering: Ross Seider Head of Customer Service: Steven Puchkoff Geographic Coverage: National Year Established: 1981 Number of Employees: 70

# CONNECTICUT

MICROCOMPUTER, INC. 36 Del Mar Dr. Brookfield, CT 06804 (203) 775-4595 **Rajor Market:** Communications Equipment Manufacturing Target Industries: Engineering; Industry; Laboratories; Education Head of Engineering: Richard Rosner Geographic Coverage: International Year Established: 1977 Number of Employees: 8

# CONTEL INFORMATION

SYSTEMS 130 Steamboat Road Great Neck, NY 11024 (516) 829-5900 Major Merket: Communications Equipment Manufacturing: Software House; Systems House (Commercial Target Industries: Manufacturing.; Insurance: Securities **Target Applications:** Telecommunications; Real-Time Processors Contacts Head of Marketing: G. Thomas Catherines Geographic Coverage: National Year Established: 1969 Number of Employees: 300

### CONTROL CONCEPTS

12004-B Balls Ford Road P.O. Box 2367 Manassas, VA 22110

# Vendors

(800) 368-3078 Major Market: Terminal and Peripheral Manufacturing; OEM (Perinherals-Terminals): Dealer/Distributor Target Industries: Banking: Insurance; Education; Software Houses Target Applications: Remote Net Sales: \$25 Million - \$100 Million (1983) Contacte Head of Marketing/Sales: Samuel Ginde

Head of Engineering: Roy Peters Geographic Coverage: National Year Established: 1968

Number of Employees: 420

CONTROL DATA CORP. 8100 34th Ave. S. Minneapolis, MN 55440 (612) 853-8100 Major Market: Component. Computer, Terminal, Peripheral and Communications Equipment Manufacturing; Data Services (Service Bureau) Target Industries: Manufacturing; Electric Utilities; Petroleurn/Mining; Target Applications: CAD/CAM; Computer-Based Education: Petroleum Exploration; Electrical Engineering

Head of Marketing: Tom Miller

Head of Customer Service: Gerald

Geographic Coverage: International Year Established: 1957

Number of Employees: 57,000

CONVERGENT TECHNOLOGIES, INC. 2500 Augustine Dr. Santa Clara, CA 95051 (408) 727-8830 Major Market: Computer Manufacturing Target Industries: OEM Head of Sales: Richard Merse Geographic Coverage: International Year Established: 1979 Number of Employees: 820

CONVERSATIONAL VOICE HINAL CORP. 4205 Grove Ave Gurnee II 60031 (312) 266-6633 Major Market: Terminal and Communications Equipment Manufacturing Net Sales: \$1 Million - \$5 Million (1982) Head of Marketing: Barbara Lounsbery Head of Sales: Robert Morgan Geographic Coverage: International Year Established: 1968 Number of Employees: 25

CORVUS SYSTEMS, INC. 2029 O'Toole Ave. San Jose, CA 95131

(408) 946-7700 Major Market: Computer and Peripheral Manufacturing; Software House Target Industries: Fortune 1000 Head of Marketing: Joseph D. **Hughes** Head of Engineering: Joseph McMain Geographic Coverage: International Year Established: 1979 Number of Employees: 325

CPT CORP. 8100 Mitchell Road P.O. Box 295 Minneapolis, MN 55440 (612) 937-8000 Major Market: Communications Equipment and Office Equipment Manufacturing; Software House Systems House (Commercial OEM) **Target Applications: WP** Contacts Head of Marketing: Fred Valler Head of Sales: Bob Gallagher Head of Engineering: Jim Wienhold Geographic Coverage: International Year Established: 1971

Suite 182 5456 McConell Ave. Los Angeles, CA 90066 (813) 822-5112 Major Market: Computer Manufacturing Target Industries: Retail; Fortune 2000 Target Applications: Management Head of Engineering: Jerry Lohoff Geographic Coverage: International Year Established: 1963 Number of Employees: 14

Number of Employees: 1,500

CR COMPUTER SYSTEMS

280 Bernardo Ave. Mountain View, CA 94043 (415) 964-7400 Major Market: Component, Computer, Peripheral and Communications Equipment Manufacturing Contacts Head of Marketing: Andrew Procassini Head of Engineering: Dr. Roger Melen Geographic Coverage: National Year Established: 1975

CROMENCO, INC.

Number of Employees: 500 CROSSPOINT SYSTEMS, INC. P.O. Box 5131 81 Centennial Loop Eugene, OR 97405 (503) 485-4254 Major Market: Communications Equipment Manufacturing Target Industries: Newspapers; Publishing; Media Net Sales: \$100,000 - \$500,000 (1981) Contac Head of Engineering: Fred Yunker Geographic Coverage: National

Year Established: 1978 Number of Employees: 6

CULLINET SOFTWARE, INC. 400 Blue Hill Dr. Westwood, MA 02090 (617) 329-7700 or Market: Software House: Data Services (Service Bureau) Target Industries: Banking; Insurance; Manufacturing **Target Applications: DBMS** Contr Head of Marketing: Frank L. Geographic Coverage: International Year Established: 1968 Number of Employees: 525 CXC CORP.

2852 Alton Ave Irvine, CA 92714 (714) 660-1801 ajor Market: Communications Equipment Manufacturing Target Industries: Fortune 500; Communications Head of Marketing: Bob Hawk Geographic Coverage: international Year Established: 1981 Number of Employees: 200

CVR SYSTEMS, INC. Suite D106 6448 Highway 290 E. Austin, TX 78723 (512) 458-3224 nior Market: Computer Manufacturing Target Industries: OEM Head of Marketing: Mark Elisworth Head of Sales: John Osbourne Head of Software: Brad Benton Geographic Coverage: International Year Established: 1982 Number of Employees: 40

CYGNET TECHNOLOGIES, 1296 Lawrence Station Road Sunnyvale, CA 94089 (408) 734-9946 Major Market: Peripheral Communications Equipment and Office Equipment Manufacturing; Dealer/Distributor Target Industries: Finance; Manufacturing: Banking: Services Target Applications: Networks; Electronic Mail; Communications Management: Productivity Contacts: Head of Marketing: Jerry Klein Head of Sales: Tony Ulperino Head of Software: Eric Ha Head of Engineering: Lauren Yazolino Head of Customer Service: Jim Robde Year Established: 1981 Number of Employees: 100

CYTROL, INC. 4620 W 77th St Edina, MN 55435 (612) 835-4884 Major Market: Software House Target industries: Finance: Travel: Transportation; Manufacturing Target Applications: Inventory; Securities Trading: Passenger Ticketing Net Sales: \$1 Million - \$5 Million (1982)Contr Head of Marketing: Tom Lobb Head of Software: Johan Nik Kirkeng Geographic Coverage: International Year Established: 1969 Number of Employees: 85

D. L. MACHEIL ENGINEERING 2208 Landmeier Road Elk Grove Village, IL 60007 (312) 952-8300 Major Market: OEM (Computer Systems); OEM (Peripherals Terminals): Software House: Systems House (Commercial OEM): Dealer/Distributor Target Industries: Medical; Retail Stores Geographic Coverage: National Year Established: 1971 Number of Employees: 5

D.O.M 7671 Central Ave. N.E. Minneapolis, MN 55432 (612) 784-7499 Major Market: Component Manufacturing; OEM (Computer Systems); Software House Target Industries: Retail; Hotel; Mass Merchandising; Small Busin Net Sales: \$100,000 - \$500,000 (1982)Geographic Coverage: Int Year Established: 1977 Number of Employees: 6

D&N MICRO PRODUCTS, INC. 3702 N. Wells St Fort Wayne, IN 46808 (219) 485-6414 Major Market: Component and Computer Manufacturing; OEM (Computer Systems); Software House; Dealer/Distributor Target Industries: Manufacturing; essional Net Sales: \$500,000 - \$1 Million (1981)Head of Sales: Jim Kuker Geographic Coverage: international Year Established: 1978 Number of Employees: 10

DAMFORD CORP. 350 W. 5th St. San Pedro, CA (213) 832-6401 Major Market: Software House Target Industries: Aerospace; Engineering Target Applications: Graphics; Scientific; Engineering; Custom Geographic Coverage: International Year Established: 1982 Number of Employees: 10

DAROME, INC. 5725 E. River Road Chicago, IL 60631 (312) 399-1610

Major Market: Communications Equipment Manufacturing Target Applications: Teleconferencing Contacts: Head of Sales: Bob Stewart Geographic Coverage: International Year Established: 1969 Number of Employees: 50

BATA CONTRIOL SYSTEMS
1455 Research Bivd.
Rockville, MD 20850
(301) 279-8798
Major Market: Communications
Equipment Manufacturing
Target Industries: Warehouses;
Government Security; Aerospace
Net Sales: \$1 Million - \$5 Million
(1981)
Contacts:
Head of Marketing: W. Stewart
Head of Sales: Glien Murphy
Geographic Coverage: International
Year Established: 1987
Number of Employees: 100

DATA GENERAL CORP. Information Systems Division 4400 Computer Drive Westboro, MA 01580 (617) 366-8911 Major Market: Component, Computer, Peripheral and Communications Equipment Manufacturing; Software House; Data Services (Service Bureau) Target Industries: Fortune 1000
Target Applications: OA: Industrial Automation Contacts Head of Marketing: Dave Lyons Head of Sales: Jim Hertzel Head of Software: Al Scura Geographic Coverage: International Year Established: 1969 Number of Employees: 15,000

4390 Alpha Road
Dallas, TX, 75234
(214) 386-3929
Major Market: Software House;
Systems House (Commercial OEM)
Target Industries: Cross Industry
Net Sales: \$500,000 - \$1 Million
(1981)
Coertacts:
Head of Marketing: Sharon Diveley
Head of Sales: R. L. McIntire
Geographic Coverage: International
Tear Established: 1973
Number of Employees: 11

DATA INDEX, INC.

DATA PLUS, INC.
7205 E. Lockport Place
Larton, VA 22079
(703) 550-7914
Major Market Peripheral and
Communications Equipment
Manufacturing
Target Applications: Data
Communications;
Telecommunications;
Telecommunications
Contracts:
Telecommunications
Communications
Communications
Telecommunications
Telecommun

DATA SWITCH CORP. 444 Westport Ave. Norwalk, CT 06851

(203) 847-9800

Major Market: Communications Equipment Manufacturing Corniachts Head of Sales: Jack Gaffney Head of Engineering: Gladstone Young Geographic Coverage: International Year Established: 1976 Number of Employees: 250

DATA SYSTEMS OF BATON ROUGE

ROUGE

830 Hieron Highway
Baton Rouge, LA 70809
(504) 923-0888
Mejor Market: OEM (Computer
Systems): Software House; Systems
House (Commercial OEM);
Dealer/Distributor
Target Industries: Distribution; Data
Communications; Apartment
Management
Target Applications: Data
Communications
Net Sales: \$500,000 - \$1 Million

(1981) Geographic Coverage: International Year Established: 1973 Number of Employees: 15

DATA TECHNOLOGY

INDUSTRIES
701A Whitney St.
San Lasandro, CA 94577
(415) 638-1206
Major Market: Computer
Manufacturing; Software House;
Systems House (Commercial OEM);
Dealer/Distributor
Target Industries: Banking; OEM;
Government
Target Applications: Accounting;
WP: Forecasting
Contacts:
Head of Marketing; Keith Silpper
Higad of Sales: Ted Baden
Head of Software: Jeff Cleyten
Geographic Coverage: International
Year Established: 1979

Number of Employees: 30

DATA TECHNOLOGY
INFOLOGY
INFOLOG

DATABIT, IHC.
110 Ricefield Lane
Hauppauge, NY 11788
(516) 435-4000
Major Market: Communications
Equipment Manufacturing

Contacts: Head of Marketing: Robert Olson Head of Software: Hans Barta Head of Engineering: Hank Segal Geographic Coverage: International Year Established: 1972 Number of Employees: 600

DATAGRAM CORP,
U.S. Division of Candian Corp.
11 Main St.
E. Greenwich, RI 02818
(401) 885-4940
Target Industries: Data
Communications
Contactis:
Head of Marketing: Tom McGovern
Head of Sales: Jean Thibault
Year Established: 1976
Number of Employees: 40

DATALEX CO. Suite 406 650 5th St. San Francisco, CA 94107 (415) 541-0780 Major Market Software House Target Industries: Fortune 1000 Net Sales: \$100,000 - \$500,000 (1981) Contacts: Head of Marketing: Mark Bernardi

Head of Software: Don Tibbetts Head of Customer Service: Peter Schwalbenberg Geographic Coverage: International Year Established: 1978 Number of Employees: 10

DATAMARK SYSTEMS, INC.
220 N. 1300 W.
Plessant Grove, UT 84062
(801) 785-5023
Major Market: OEM (Computer Systems); Software House
Contacts:
Head of Engineering; Grant Dearden
Geographic Coverage: International
Year Established: 1976
Number of Employees: 8

DATAPOINT CORP.

9725 Datapoint Dr.
San Antonio, TX 78284
(512) 699-7000
Major Market: Computer, Peripheral,
Communications Equipment and
Office Equipment Maunifacturing
Target Industries: General
Business; Scientific; Government
Target Applications: DDP; WP; OA;
Electronic Message
Contacts:
Head of Marketing: David Femald
Head of Sales: David Holland
Head of Software: David Ruberg
Head of Experiencing: Orbit Bencalk
Head of Customer Service: John
Hale

Hale Geographic Coverage: International Year Established: 1968 Number of Employees: 8,800

DATAPROBE, INC.
110 W. Palisades Blvd.
Palisades Park, NJ 07650
(201) 947-9500
Major Market: Communications
Equipment Manufacturing; Systems

Target industries: Data
Communications
Target Applications: Cotranslating:
Modern elimination; Switching
Systems
Net Sales: \$500,000 - \$1 Million
(1981)
Contacts:
Head of Engineering: Bob Killi
Geographic Coverage: International
Year Established: 1989
Number of Employees: 15

House (Commercial OEM):

DATAPROBUCTS CORP.
6200 Canoga Ave.
P.O. Box 746
Woodland Hills, GA 91365
(213) 887-8000
Major Market: Terminal, Peripheral
and Communications Equipment
Manufacturing; OEM (Peripherals-Terminals)
Corritacts:
Head of Marketing; John Harker
Head of Sales; Jim Towell
Head of Engineering; Clifford Jones
Geographic Coverage: International
Year Established: 1802
Number of Employees: 4,600

DATAPRODUCTS NEW
ENGLAMD, INC.
Data Communications Division
Barnes Park N.
Wallingford, CT 08492
(203) 285-7151
Major Market Terminal and
Communications Equipment
Manufacturing; OEM (Computer
Systems): Software House
Target Industries: Military;
Telephone; Insurance; Oil
Target Applications: Network
Management; Encryption
Contracts.
Head of Marketing: J. Flaherty
Head of Engineering; W. Gallagher
Geographic Coverage: International
Year Established: 1951
Number of Employees: 700

DATASOFT, INC.

9421 Wirnettaa Ave.
Chatsworth, CA 91311
(213) 701-515 oftware House
Target Industries: Consumer
Net Sales: \$1 Million - \$5 Million
(1981)
Contacts:
Head of Marketing: Dennis Wallin
Head of Sales: Scott Llewellyn
Head of Software: Steve Bjork
Geographic Coverage: International
Year Established: 1980
Number of Employees: 35

DATASTREAM
COMMUNICATION, INC.
2520 Mission College Blvd.
Santa Clara, CA 95500
(406) 986-9022
Major Market Communications
Equipment Manufacturing
Target Applications: IBM 3270
Cluster
Net Sales: \$1 Million - \$5 Million
(1981)

Contacts: Head of Sales: Stanley G. Sartor Geographic Coverage: International Year Established: 1978 Number of Employees: 50

DATATEL, INC.
Pin Oak & Springdale
Cherry Hill Industrial Center
Cherry Hill Industrial Center
Cherry Hill, NJ 08003
Major Market: Communications
Equipment Manufacturing
Target Industries: Education
Contacts:
Head of Marketing: Tom Hornsby
Head of Engineering: Herb Baldwin
Year Established: 1979
Number of Employees: 35

DATEC, INC.
Suite 116
200 Eastowne Dr.
Chapel Hill, NC 27514
(919) 929-2135
Major Markets Communications
Equipment Manufacturing
Contacta:
Head of Marketing: Albert M. Jenks
Head of Sales: Tod Wilss
Geographic Coverage: National
Year Established: 1976
Number of Employees: 65

DAYONG SYSTEMS, INC.
217 Hombott Court Dr.
Surnywelle, CA 94086
(408) 734-4900
Mejor Market: Peripheral
Marufacturing Terget industries: Retail
Contacts:
Head of Marketing: Chuck Depew
Head of Sales: Donna Barry
Head of Sales: Donna Barry
Head of Software: Tim Lundeen
Head of Engineering. R. Apt
Geographic Coverage: International
Year Established: 1981
Number of Employees: 150

DAYCOM CORP. 2971 Bluefield Ave Dayton OH 45414 (513) 278-7937 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems) **Target Industries: Airlines** Target Applications: Information Display; Communications Systems Contr Head of Marketing: Jim Kausenberg Head of Sales: Hans Hoogendoom Head of Engineering: Harold Hemmelgran Geographic Coverage: International Year Established: 1946 Number of Employees: 100

DCAITAC Formerly Digital Communications & Technical Analysis 303 Research Dr. Norcross, GA 30092 (404) 448-1400 Major Market: Communications Equipment Manufacturing Target Industries: Time-Sharing: Education; OEM Contacts: Head of Marketing: James B. Lee III Head of Engineering: Stan Lamberski Geographic Coverage: International Year Established: 1972 Number of Employees: 130

DEFANO SOFTWARE
SYATEMS, INC.
Suite 4
725 Fifth St.
Horricos Beach, CA 90254
(213) 318-1661
Major Market: Software House;
Systems House (Commercial DEM)
Target Industries: IBM Users
Net Sales: \$100,000 - \$500,000
(1982)
Contracts:
Head of Marketing: Leslie Borg
Head of Software: Julio DeFaro
Head of Engineering: Gary Abbott
Geographic Coverage: National
Year Established: 1977

DBE-TELEPRODUCTS, INC.
2128 Vineyard Ave.
Escondido, CA 92025
(619) 743-8344
Major Market: Communications
Equipment Manufacturing; Data
Services (Service Bureau)
Contacts:
Head of Marketing: Art Wallace
Head of Engineering: Greg Graham
Year Established: 1969
Number of Employees: 40

Number of Employees: 9

DRLYA SYSTEMS, INC.
711 5th Ave. N.
Sastite, WA. 98109
(208) 283-5500
Major Market: Component,
Peripharal and Communications
Equipment Manufacturing; Systems
House (Commercial OEM); Data
Services (Service Bureau)
Net Salea: \$1 Million - \$5 Million
(1991)
Contacta:
Head of Sales: Scott Carey
Head of Software: Mark Chamberlain
Geographic Coverage: International
Year Established: 1971
Number of Employees: 25

THE DESTEK GROUP

830C E. Evelyn Ave.
Sunnyvale, CA 94086
(408) 737-7211
Major Market Communications
Equipment Manufacturing; Software
House
Target Applications: Networking
Contacts:
Head of Marketing: Denis Reiger
Geographic Coverage: International
Year Established: 1991
Number of Employees: 20

DEVELOON ELECTRONICS, INC... 4037 Swamp Road Doylestown, PA 18901 (215) 348-1900 Major Market: Communications Equipment Manufacturing; Dealer/Distributor Target Industries: Fortune 1000; Universities; Marufacturing; Government Contacts: Head of Marketing; Anthony Severino Geographic Coverage: National Year Established: 1973 Number of Employees: 35

DIGILOG, INC.
Network Control Division
1370 Welsh Road
Montgomeryrille, PA 18936
(215) 828-4530
Major Market: Communications
Equipment Manufacturing; OEM
(Computer Systems)
Contacts:
Head of Marketing: Roy Gemberling
Lead of Engineering: Thomas Emory
Head of Customer Service: Robert
Armstrong
Geographic Coverage: International
Year Established: 1969
Number of Employees: 175

DIGITAL ASSOCIATES CORP.
1039 E. Main St.
Stamford, CT 06902
(203) 327-9210
Major Market Communications
Equipment Manufaçturing; OEM (Peripherals-Terminals); Systems
House (Commercial OEM); Remote-Line Printer Systems
Target Industries: Minicomputer, Banking; Education; End Users
Contacts:
Head of Marketing: Ed Thomas
Head of Sales: Simon Harvey
Head of Software: Wallace Ritchie

DIGITAL CONTROLS CORP.
2779 Orchard Bun Road
Dayton, OH 45449
(513) 435-555
Mejor Market: Communications
Equipment Manufacturing;
Dealer/Distributor; Peripheral
Switching
Net Sales: \$1 Million - \$5 Million
(1981)
Contacts:
Head of Marketing: Greg Collins
Head of Sales: Steven Lachey
Head of Engineering: Jon Lenehan
Geographic Coverage: International
Year Established: 1987
Number of Employees: 43

Geographic Coverage: National Year Established: 1971 Number of Employees: 40

DIGITAL EQUIPMENT CORP.
146 Main St.
Maynard, MA 01754
(617) 897-5111
Major Market Component,
Computer, Terminal, Peripheral and
Communications Equipment
Manufacturing; Software House;
Dealer/Distributor
Geographic Coverage; International
Year Established: 1957
Number of Employees: 75,000

DIGITAL LABORATORIES, INC. 600 Pleasant St.

Watertown, MA 02172 (617) 924-1680 Major Markete Peripheral and Communications Equipment Manufacturing Target Applications: Communications Net Sales: \$500,000 - \$1 Million (1981) Contacts: Head of Marketing: W. Kahn Head of Soltware: W. Kahn Head of Soltware: W. Kahn Head of Customer Service: P. Krawitz Geographic Coverage: Regional Year Established: 1971 Number of Employees: 12

DIGITAL MICROSYSTEMS, MC. (DMS)
1755 Embarcadero
Oakland, CA 94806
(415) 532-9886
Major Market: Computer
Manufacturing
Target Industries; ISO; OEM;
Fortune 1000
Target Applications: OA; MRP
Contacts:
Head of Marketing: Frank Wishom
Head of Engineering: Joseph
Duvivier
Geographic Coverage: International
Number of Employees: 50

DILKS CO., INC.
195 Buckhorn Lan
Reston, VA 22091
(703) 471-4172
Major Market: OEM (Computer
Systems): Software House; Systems
House (Commercial OEM)
Target Industries: Aviation
Target Applications: Air-Traffic
Controt: Weather; Radar
Net Sales: \$100,000 - \$500,000
(1981)
Contacts:
Head of Marketing: Philip Mills
Geographic Coverage: Regional
Year Established: 1974
Number of Employees: 5

DIVELBISS CORP. 9776 Mt. Gilead Roa Fredericktown, OH 43019 (614) 694-9015 Major Market: OEM (Computer Systems); Software House; Systems House (Commercial OEM): Manufacturing test equipment Target Industries: Engineering; Engineering Target Applications: Testing Control Equipment; Machine Control; Telecommunication Net Sales: \$1 Million - \$5 Million (1981)Contacts Head of Marketing: Ralph Williams Geographic Coverage: National Year Established: 1974 Number of Employees: 25

DIVERSIFIED DATA RESOURCES, INC. Suite 7 25 Mitchell Blvd. San Rafaei, CA 94903
(415) 499-9870
Major Market: Communications
Equipment Manufacturing; Software
House
Target Industries: IBM 360/370
Users
Contacts:
Head of Marketing: David Gortner
Geographic Coverage: National
Year Established: 1981
Number of Employees: 30

Darw GROUP
2020 Hogback Road
Ann Arbor, MI 48104
(313) 971-5234
Major Market: Software House
Target Industries:
Telecommunications
Target Applications: Network
Design
Geographic Geverage: International
Year Established: 1971
Number of Employees: 100

DON'T ASK COMPUTER
SOFTWARE
Suite B150
2265 Westwood Blvd.
Los Angeles, CA 90064
(213) 397-8811
Major Market: Software House
Target Applications: Recreation
Contacts:
Head of Marketing: Rachel Cohen
Geographic Coverage: International
Year Established: 1981
Number of Employees: 25

BURACOM CORP.
7300 N. Crescent Blvd.
Building 5
Pennsauken, NJ 08110
(609) 682-7272
(609) 682-7273
Major Market Communications
Equipment Manufacturing
Target Industries: Manufacturing
Contacts:
Head of Marketing: J. E. Courtney
Geographic Coverage: National
Year Established: 1972
Number of Employees: 6

DUXBURY SYSTEMS, ING.
77 Great Road
Acton, MA 01720
(617) 283-7761
Mejor Market: DEM (Computer
Systems): Software House; Systems
House (Commercial OEM);
Dealer/Distributor
Net Sales: \$100,000 - \$500,000
(1981)

Head of Marketing: Dana M. Winikates Geographic Coverage: International Year Established: 1975 Number of Employees: 5

DYNAMIC MICROPROCESSOR ASSOCIATES Suite 602 545 5th Ave. New York, NY 10017 (212) 687-7115
Major Market: Software House
Target Industries: Utilities;
Communications; Systems Houses
Target Applications: DSMS;
Applications, Report Generators;
Communications
Net Sales: \$500,000 - \$1 Million
(1981)
Contacts:
Head of Software: Lee Rautenberg
Geographic Coverage: International
Year Established: 1979

Number of Employees: 9

DYNAMIC SCIENCES, INC.

7860 Gloria Ave.
Van Nuys, C. A. 91406
(213) 782-0820
Major Market: Component and
Communications Equipment
Manufacturing; CEM (Computer
Systems); Software House
Target Industries: EM; EMC;
TemTest
Terget Applications: Department of
Defense; Industry
Contacts:
Head of Marketing; Daniel Donovan
Head of Sales; Jim Pyle
Head of Engineering; Jack Birdsall
Geographic Coverage; International
Year Established; 1972
Number of Employees; 180

Number of Employees: 180

OYNATECH DATA SYSTEMS
764 Dynatch Court
Springleid, VA 22153
(703) 569-900
Major Market: Communications
Equipment Manufacturing
Target Industries: Banking:
Transportation; Finance
Contacts:
Head of Marketing: V. K. Damell
Head of Sales: Million Coleman

Head of Engineering: Nat Kumar Head of Customer Service: Jack McIlnay Geographic Coverage: International Year Established: 1952 Number of Employees: 250

DYNATECH PACKET
TECHNOLOGY, INC.
6464-G General Green Way
Alexandria, VA 22312
(703) 642-9391
Major Market: Communications
Equipment Manufacturing; Data
Communications Engineering
Target Industries: Banking; Finance;
Transportation
Contacts:
Head of Marketing; K. L. Damanda
Head of Engineering; Jose Prats
Head of General Communications
Fransportation
Contacts:
Head of Control Contacts:
Well of Engineering; Jose Prats
Head of Control Control Contacts:
Well of Engineering; Jose Prats
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Head of Control Control
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EDGE TECHNOLOGY
2735 S.E. Raymond
Portland, OR 97202
(503) 231-1057
Major Market: Peripheral and
Communications Equipment
Manufacturing

Target Industries: Communications; OA
Target Applications: Credit
Reporting
Net Sales: \$1 Million - \$5 Million
(1981)
Geographic Coverage: International
Year Established: 1977
Number of Employees: 15

EFT COMPUTER SYSTEMS, INC.
One Parmiey Place
Summit, NJ 07901
(212) 947-771
Major Market: Software House
Target Industries: Banking
Target Applications: EFT
Net Sales: \$500,000 - \$1 Million
(1981)
Contacts:
Head of Marketing: Gamer R.
Morgan
Geographic Coverage: Regional
Year Established: 1977
Number of Employees: 15

ELECTRODATA, INC.

23020 Miles Road
Bedford Heights, OH 44128
(216) 683-3333
Mejor Markets Communications
Equipment Manufacturing
Target Industries: Data
Communications
Net Sales: \$1 Million - \$5 Million
(1981)
Contacts:
Head of Marketing: Philip Andire
Head of Engineering: James Spoth
Geographic Coverage: International
Year Established: 1976
Number of Employees: 20

ELECTRONIC INTERFACE ASSOCIATES 38 E. 29th St. New York, NY 10016 (212) 683-9100 Major Market: Communications Equipment Manufacturing: OEM (Computer Systems); Software House; Systems House (Commercial OEM); Data Services (Service Bureau): Dealer/Distributor Target Industries: Banking; Publishing Target Applications: Data Communications Head of Sales: Hai Forman Head of Engineering: Yasha Katz Geographic Coverage: Regional Year Established: 1977 Number of Employees: 18

EMTROL SYSTEMS, INC. 123 Locust St. Lancester, PA 17602 (717) 291-1116 Major Market. Communications Equipment Manufacturing Geographic Coverage: National Year Established: 1978 Number of Employees: 31

S545 Harbor Blvd. P.O. Box 6725 Costa Mesa, CA 92626 (714) 662-5600 Major Market: Peripheral Manufacturing; Communications Equipment Manufacturing Target Industries: End Users; OEM; System House Contacta: Head of Marketing: Sol Zechter Head of Marketing: Sol Zechter Head of Engineering: Bob Snyder Geographic Coverage: International Year Established: 1979 Number of Employees: 525

ENGINEERED SYSTEMS, INC.
Information Systems Division
14775 Grover St.
Omaha, NE 68144
(402) 333-0100
Major Market: Communications
Equipment Manufacturing
Target Industries: End User;
Banking; Credit Unions
Contacta:
Head of Marketing: W. H. Taylor
Head of Engineering: Gill Fillan
Geographic Coverage: International
Year Established: 1989
Number of Employees: 50

EINVAX SYSTEMS, INC.
3330 Stoval
Irving, TX 75061
(214) 986-1151
Major Market: Communications
Equipment Manufacturing
Contacts:
Head of Marketing: Jennifer Hemmes
Head of Sales: Harry Rayner
Geographic Coverage: National
Year Eatablished: 1568
Number of Employees: 50

ERICSON PROGMATIC, INC.
11211 Richmond Ave.
Houston, TX 77082
Major Market: Communications
Equipment Manufacturing; CEM (Peripherals-Terminals)
Target Applications: Data
Communications
Contacts:
Head of Marketing: Peter Walsh
Number of Employees: 65

ESCA CORP.
13010 Northup Way
Believue, WA 98005
(206) 885-5077
Major Marketi: Software House
Contacts:
Head of Marketing: Robin Padwork
Head of Sales: Morris Peterson
Head of Software: Edward
Krzyzanowish
Geographic Coverage: International

EVANS, GRIFFITHS AND HART, INC. 55 Waitham St. Lexington, MA 02173 Major Market: Software House Target Applications: Data Entry; DBMS Contacts: Head of Marketing: Tom Griffiths Geographic Coverage: International

Year Established: 1970 Number of Employees: 15

### EVERGREEN CONSULTING. INC

Suite 520 3407 W. Sixth St. Los Angeles, CA 90020 (213) 662-3337 fajor Market: Software House Target Applications: iBM Communications Software Net Sales: \$500,000 - \$1 Million Geographic Coverage: National Year Established: 1978 Number of Employees: 6

### EXCELAN

2180 Fortune Dr. San Jose CA 95131 (408) 945-9526 Major Merket: Communications **Equipment Manufacturing** Target Industries: Systems Integrators Contacts Head of Marketing: Dale Way Head of Sales: Doug Planchon Geographic Coverage: International Year Established: 1982 Number of Employees: 40

## EXEC SOFTWARE, INC.

201 Waltham St. Lexington, MA 02173 (617) 862-3170 Major Market: Software House Contacts: Head of Sales: Jean Mayo Year Established: 1981 Number of Employees: 8

**EXXON ENTERPRISES** Exxon Office Systems Co. 777 Long Ridge Road Stamford, CT 06902 (203) 329-5000 Major Market: Peripheral and Office Equipment Manufacturing Target Applications: OA Cont Head of Marketing: Douglas V. Head of Customer Service: Frank J. Bruscato Geographic Coverage: International Year Established: 1981 Number of Employees: 3,000

### FALLON & ASSOCIATES, INC.

P.O. Box 1850 Upland, CA 91786 (714) 985-5088 Major Market: Software House: Data Services (Service Bureau) Geographic Coverage: International Year Established: 1969 Number of Employees: 3

### FEROX MICROSYSTEMS, INC.

Suite 611 1701 N. Fort Meyer Dr. Arlington, VA 22209 (703) 841-0800 Major Market: Software House Target Applications: Financial Planning; Graphics; Data Communication

Net Sales: \$500,000 - \$1 Million Contacto Head of Marketing/Sales: Richard Hykes Head of Software: David Galfand Geographic Coverage: International Year Established: 1979

# Number of Employees: 25 FIBRONICS INTERNATIONAL

218 W. Main St. Hyannis, MA 02601 (617) 778-0700 Major Market: Communications Equipment Manufacturing Target Industries: Industrial; Financial; Health Care; Military **Target Applications: Data** Transmission; Fiber Optics Not Sales: \$1 Million - \$5 Million (1983) Head of Marketing: J. Morris Weinberg Head of Sales: Kenneth Bowes Geographic Coverage: International Year Established: 1977 Number of Employees: 106

### FIRESIGN COMPUTER CO.

Suite 208 524 Union St San Francisco, CA 94133 (415) 398-7228 Major Market: Software House Target Applications: Data Communications Net Sales: \$100,000 - \$500,000 Geographic Coverage: National Year Established: 1975 Number of Employees: 3

FORMSCAN, INC. Suite 2610 Huntington Quadrangle Melville, NY 11747 (516) 752-0032 Major Market: Communications Equipment Manufacturing; Software House: Systems House (Commercial OEM): Data Services (Service Target Industries: Oil Companies;

Banks: International Organizations: Target Applications: Networking; Conversion: Coexistence WP Contacts Head of Marketing: Nigel Hall Head of Customer Service: John

Year Established: 1981 Number of Employees: 5

FORMULA CONSULTANTS, P.O. Box 544 Anaheim, CA 92805 (714) 778-1738 Major Market: Software House Head of Software: Tony J. Sapienza Head of Engineering: Fritz Lorenz Geographic Coverage: International Year Established: 1978 Number of Employees: 22

## FRIEDMAN ASSOCIATES

2424 Morris Ave Union N.I 07083 (201) 964-2600 Rajor Market: Communications Equipment Manufacturing; Dealer/Distributor Year Established: 1964 Number of Employees: 8

FUJITSU AMERICA, INC. 2975 Oakmead Village Dr. Santa Clara, CA 95051 (408) 727-4300 Major Market: Peripheral and Communications Equipment Manufacturing; Office Equipment Manufacturing; Dealer/Distributor Target Industries: OEM Head of Marketing: Norm Peterson Head of Software: Fred Bihler Head of Engineering: Ken Katashiba Geographic Coverage: International Year Established: 1976

# Number of Employees: 300 O & O ENGINEERING

1922 Republic Ave. San Leandro, CA 94577 (415) 895-0798 Major Market: Software House Systems House (Commercial OEM) Contacts: Head of Marketing: Michael Gifford Head of Software: Dale Giff Head of Engineering: Gerald Houston Geographic Coverage: National Year Established: 1980 Number of Employees: 25

GAMMA TECHNOLOGY, INC. 2452 Embarcadero Way Palo Alto, CA 94303 (415) 856-7421

Major Market: Software House **Target Applications:** Data Communication Net Sales: \$100,000 - \$500,000 Geographic Coverage: International Year Established: 1974 Number of Employees: 4

### **GANDALF DATA, INC.**

1019 S. Noel Ave.

Wheeling, IL 60090 (312) 541-6060 Major Market: Communications Equipment Manufacturing Target Industries: Common Carriers: Government: Industries: Education Target Applications: DP; Data Entry; OA; Communications Networking Contacts Head of Marketing: Verne Zugenbuhler Head of Engineering: Jan Barti Geographic Coverage: International Year Established: 1973 Number of Employees: 325

COMMUNICATIONS, INC. 16782 Red Hill Irvine, CA 92714

(714) 261-0762 Major Market: Computer Manufacturing; Communications Equipment Manufacturing; Office Equipment Manufacturing; Software House; Systems House (Commercial OEM) Target Applications: Resource Sharing; X.25 PADS; SNA/3270 Emulation Contacts Head of Marketing: Larry Stevenson Year Established: 1981 Number of Employees: 18

### GAYLORD BROS., INC.

P.O. Box 4901 Syracuse, NY 13221 (315) 457-5070 Major Market: Software House; Dealer/Distributor Target Industries: Library: Contacts Head of Engineering: Jim Dokoupil Head of Customer Service: Peggy Trinca Geographic Coverage: International Number of Employees: 300

GEJAC, INC. P.O. Box 188 Riverdale, MD 20737 (301) 864-3700 Major Market: Software House Net Sales: \$100,000 - \$500,000 (1981)Contacts: Head of Marketing: Susan Kalichstein

Geographic Coverage: International Year Established: 1977 Number of Employees: 10

### GENASYS CORP.

11820 Parklawn Dr. Rockville, MD 20852 (301) 770-4600 Major Market: Software House Target Industries: Government Target Applications: Accounting; Facilities Management Contacts: Head of Marketing: Ronald Husey Geographic Coverage: National Year Established: 1968 Number of Employees: 150

# GENERAL DATACOMM INDUSTRIES, INC.

One Kennedy Ave. Danbury, CT 06810 (203) 797-0711 Major Market: Communications Equipment Manufacturing Target industries: Fortune 1000; Telephone: International Record Carriers; International Development **Target Applications: Network** Diagnostics; Data Communications, Modem and Mux Systems Contacts: Head of Marketing: Hugh Tremblay Head of Males: Robert F. Hendee Head of Engineering: W. Raymond Geographic Coverage: International Year Established: 1969

### GENERAL DIGITAL

INDUSTRIES, INC. 7702 Governors Dr. Huntsville, AL 35805 (205) 837-8305 Major Market: Component, Computer and Terminal Manufacturing; OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Manufacturing; System House; Software Development Firms; OEM Net Sales: \$1 Million - \$5 Million (1982)Contacts Head of Marketing: Lyle Needham Head of Software: John D.Reynolds Geographic Coverage: National Year Established: 1978 Number of Employees: 40

### GENERAL ELECTRIC CO.

One River Road Schenectady, NY 12345 (518) 385-2211 Major Market: Component. Terminal, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems); Software House; Data Services (Service Bureau) Target Applications: Factory Automation: CAD/CAM Net Sales: \$100,000 - \$500,000 Head of Marketing: Thomas O. Thorsen Geographic Coverage: International Year Established: 1892 mber of Employees: 404,000

### GENERAL ELECTRIC INFORMATION SERVICES CO.

401 N. Washington St. Rockville MD 20850 (301) 340-4000 Major Market: Software House; Data Services (Service Bureau) Geographic Coverage: International Year Established: 1964 Number of Employees: 5,000

### GENCOMP, INC. 6 Algonquin St.

Canton, MA 02021 (617) 828-2008 Major Market: Communications **Equipment Manufacturing** Target Industries: OEM; Dealers Year Established: 1976

# GEORGE W. HALLAHAM & CO.,

1660 Soldiers Field Road Boston, MA 02135 (617) 782-6100 Major Market: Software House: Data Services (Service Bureau) Target Industries: Distribution; Clubs **Target Applications:** Communications Head of Marketing: Art Greenberg Geographic Coverage: National Year Established: 1979 Number of Employees: 12

### GLASGAL COMMUNICATIONS. INC.

207 Washington St. Northvale, NJ 07647 (201) 768-8082 Major Market: Dealer/Distributor Contacts Head of Customer Service: Ken Yeer Established: 1973 Number of Employees: 30

### QLENAYRE ELECTRONICS

1551 Columbia St. North Vancouver (206) 676-1980 Major Market: Communications Equipment Manufacturing Head of Marketing: John McDermott Head of Sales: Mike Hodson Head of Engineering: Roy Smyth Geographic Coverage: International Year Established: 1947 Number of Employees: 180

### GLENN A. BARBER AND ASSOCIATES Suite 304

15010 Ventura Blvd. Sherman Oaks, CA 91403 (213) 907-6622 Major Market: Software House Target Industries: OEM Net Sales: \$1 Million - \$5 Million (1982) Contact Head of Marketing: Gary Cline Geographic Coverage: International Year Established: 1980 Number of Employees: 25

### GOULD, INC.

SEL Computer Systems 6901 West Sunrise Blvd. Fort Lauderdale, FL 33313 (305) 587-2900 Major Market: Computer Manufacturing; OEM (Peripherals-Terminals): Software House Target Industries: Aerospace; Military; Nuclear; Fossil Fuel Target Applications: Flight Simulation; Energy Monitoring/Control; Lab Computation; Factory Automation Contacts: Head of Marketing: John Muczko Head of Sales: Calvin Shoemaker Head of Software: Robert Bergmam Head of Engineering: Michael Smith Head of Customer Service: Edward Shephard Geographic Coverage: International Year Established: 1961 Number of Employees: 2,500

### GOULD, INC.

Programmable Controller Division P.O. Box 3083 Andover, MA 01810 (617) 475-4700 Major Market: Peripheral and Communications Equipment Manufacturing; Programable Controllers Target Industries: Manufacturing **Target Applications:** Factory Automation; Process Control Contacts Head of Marketing: Steven Mader

Head of Sales: George Danneker Head of Engineering: John J. Joslyn Head of Customer Service: Richard Balmas

Geographic Coverage: International Year Established: 1969 Number of Employees: 1,600

# GRANADA SYSTEMS DESIGN,

303 Fifth Ave. New York, NY 10016 (212) 686-6945 Major Market: OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Banking: Distribution: Textile Target Applications: Billing; Banking; WP; Voice Respons Net Sales: \$100,000 - \$500,000 (1981) Contacts: Head of Marketing: Gulab Bhavnani Head of Software: Robert Acke Geographic Coverage: National Year Established: 1979

### Number of Employees: 8 GRAPHIC SOFTWARE SYSTEMS

25117 S.W. Pkwy. Wilsonville, OR 97070 (503) 682-1606 Major Market: Software House Target Industries: Business Contacts: Head of Sales: Jon Gordon Head of Sales: John Gordon Head of Engineering: Russ Sprunger Geographic Coverage: International Year Established: 1981 Number of Employees: 12

# GTE BUSINESS COMMUNICATIONS SYSTEMS, INC.

12502 Sunrise Valley Dr. Reston, VA 22096 (703) 435-7400 Major Market: Communications Equipment Manufacturing; Dealer/Distributor Target Industries: Business; Institutions; Government Head of Marketing: Paul Wexler Head of Sales: Bob Smith Head of Engineering: Tom Monaghan Geographic Coverage: International Year Established: 1978 Number of Employees: 5,000

# GTE TELENET

COMMUNICATIONS CORP. 8229 Boone Blvd. Vienna, VA 22180 (703) 442-1000 Major Market: Communications Equipment Manufacturing; Communications Networks Target Industries: Banking; Transportation; Communications Contacts: Head of Marketing: W. Comes Head of Sales: Henry R. Nothhaft Head of Software: Paolo Guidi Year Established: 1972
Number of Employees: 900

### GTECH CORP. 101 Dyer St. Providence, RI 02903 (401) 273-7700

Major Market: Terminal and Communications Equipment Manufacturing; OEM (Computer Systems); OEM (Perioherals-Terminals) Contacts Head of Marketing: Peter Morrissey Head of Sales: George Murray Head of Software: Alex Burstien Head of Engineering: William Metzger Geographic Coverage: International Year Established: 1981 Number of Employees: 200

# QUILD, INC.

590 Danbury Road Ridgefield, CT 06877 (203) 431-0411 Major Market: Software House Target Applications: Prototyping Net Sales: \$100,000 - \$500,000

Geographic Coverage: National Year Established: 1979 Number of Employees: 12

## GUNN ENTERPRISES, INC.

Suite 150 5615 Richmond P.O. Box 27474-77227 Houston, TX 77057 (713) 781-6911 Major Market: Software House: Systems House (Commercial OEM): Dealer/Distributor Target Industries: Professional Target Applications: WP; Data Base Net Sales: \$100,000 - \$500,000 (1982) Geographic Coverage: International Year Established: 1979 Number of Employees: 5

## H & A COMPUTER SYSTEMS

Suite 204 30 Hotaling Place San Francisco, CA 94111 (415) 434-3517 Major Market: Software House: Dealer/Distributor
Target Applications: Application Generation; System Software Net Sales: \$1 Million - \$5 Million (1982)Contacts Head of Marketing: Kathleen Reilly Head of Software: Nick Nickerson Geographic Coverage: National Year Established: 1978 Number of Employees: 22

## HALCYON COMMUNICATIONS

Data Systems Division 2121 Zanker Road San Jose, CA 95131 (408) 293-9970 Major Market: Communications Equipment Manufacturing Target Industries: Banking

**Target Applications: Analog** Head of Marketing: Stan Guzik Head of Sales: Erv Stein Head of Engineering: Park Adams Geographic Coverage: International Year Established: 1971 Number of Employees: 250

HARRIS CORP. Information Systems Group 1025 W. Nasa Blvd. Melbourne FL 32919 (305) 727-9100 Major Market: Computer, Terminal and Communications Equipment Manufacturing: Software House: Special Systems Manufacturing Target Industries: Manufacturing; ntific; Government; Education **Target Applications: Office** Systems: Scientific: Control: Engineering Geographic Coverage: International Number of Employees: 5,000

HARRIS CORP. Computer Systems Division 2101 West Cyprus Creek Road Ft. Lauderdale, FL 33309 (305) 974-1700 Major Market: Computer, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems): Software House: Systems House (Commercial OEM); Data Services (Service Bureau); Special Systems Target Industries: Engineering Technology; Aerospace; Scientific Research; OA **Target Applications: Data** Aguisition: CAD/CAM: Data Reduction; Design and Simulation

Head of Marketing: James Oyler Head of Sales: J. Oromaner Head of Software: Joe Payne Geographic Coverage: International Year Established: 1971 Number of Employees: 1,000

MARRIS CORP. Digital Telephone Systems Division One Digital Dr. P.O. Box 1188 Novato, CA 94948 (415) 472-2500 Major Market: Communications Equipment Manufacturing Target Industries: Business Telephone System; Private Networks Contacts Head of Marketing: Edward Burfine Head of Sales: Vincent Cahill Head of Engineering: Alan Negrin Head of Customer Service: Terry **Yellitz** Geographic Coverage: International

Year Established: 1968 Number of Employees: 700 HAYES MICROCOMPUTER PRODUCTS, INC.

5923 Peachtree Industrial Blvd. Norcross, GA 30092 (404) 449-8791 Major Market: Communications Equipment Manufacturing; OEM

(Peripherals-Terminals) Target industries: Retail Computer Store Contente Head of Marketing: Dana S. Perkins Head of Sales: Don Huizingh Head of Software: Dan McCutcheon Head of Engineering: William Hankins Geographic Coverage: National Year Established: 1978 Number of Employees: 200

HENRIKSEN DATA SYSTEMS 12189 Raiston St. Arvada, CO 80004 (303) 425-9303 Major Market: Communications Equipment Manufacturing Target Industries: Modern Office **Target Applications:** Communications with TWX and Teley Head of Marketing/Sales: Jack

Freeman Head of Software: Bill Richard Year Established: 1980 Number of Employees: 62

HENSON SYSTEMS, INC. 427 South Olathe Way Aurora, CA 80013 (303) 690-6279 Major Market: Software House Contacts: Head of Marketing: D. Henson Year Established: 1980 Number of Employees: 3

HEURIKON CORP. 3001 Latham Dr. Madison, WI 53713 (608) 271-8700 Major Market: Component, Computer and Communications Equipment Manufacturing; OEM (Computer Systems): Systems House (Commercial OEM) Target Industries: Communications; Manufacturing; OEM Target Applications: Software Developers Net Sales: \$1 Million - \$5 Million (1981)Contacts: Head of Marketing: Christopher M. Priebe Head of Engineering: Jeffrey Mattox

Head of Customer Service: Bob May Geographic Coverage: National Year Established: 1972 Number of Employees: 55

HITACHI AMERICA, LTD. 2990 Gateway Dr. Norcross, GA 30071 (404) 458-6921 Major Market: Component. Computer and Communications Equipment Manufacturing Target Industries: Telephone; Commercial: Lodging Contacts: Head of Marketing: E. Kondo Head of Sales: Charles Kenmore Head of Software: Rick White Head of Engineering: Wally Ives Head of Customer Service: Bill

Geographic Coverage: International Year Established: 1973 Number of Employees: 80

HONEYWELL, INC. Information Systems Honeywell Plaza Minneapolis, MN 55408 (612) 870-5200 ajor Market: Computer, Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems); OEM (Peripherals Terminals); Software House; Data Services (Service Bureau); Dealer/Distributor; Special Hardware Target industries: Manufacturing/Distribution: Government; Education; Airline Contacts: Head of Marketing: George S. Geographic Coverage: International Year Established: 1955 Number of Employees: 25,000

HORNS COMPUTER SERVICES 3822 N. 25th St. St. Joseph. MI 64505 (816) 233-5418 flajor Market: Software House Systems House (Commercial OEM) Target Industries: Insurance: Financial Target Applications: Letter Writing; WP; Data Entry; Insurance

Net Sales: \$1 Million - \$5 Million (1982)Geographic Coverage: Regional Year Established: 1977 Number of Employees: 4

HOUSTON COMPUTER SERVICES, INC. Suite 101 1221 Richmond **Building C** Houston, TX 77082 (713) 558-9900 Major Market: Software House Target Applications: Language Net Sales: \$500,000 - \$1 Million (1981)

Contacts: Head of Software: Stephen Starke Geographic Coverage: National Year Established: 1979 Number of Employees: 6

HOUSTON ENGINEERING RESEARCH CORP.

P.O. Box 3246 7250 Wynnwood Dr. Houston, TX 77001 (713) 869-9371 Major Market: Computer Manufacturing: OEM (Computer Systems); OEM (Peripherals Terminals); Software House; Systems House (Commercial OEM) Target Industries: Chemical: Paper: Target Applications: Scada; Tank Gauging; Auto Production Reporting Net Sales: \$1 Million — \$5 Million

(1981)

Head of Sales: John A. Chapm Head of Engineering: Joseph Dryer Head of Customer Service: John A. Chapman

Geographic Coverage: International Year Established: 1960 Number of Employees: 50

HOWARD W. SAMS & CO., INC. 4300 W. 62nd St. Indianapolis, IN 46206 (317) 298-5400 Major Market: Software House Target Industries: Small Business Net Sales: \$1 Million — \$5 Million (1981) Conta Head of Marketing: Kenneth Jones Geographic Coverage: International Year Established: 1980 Number of Employees: 600

HOWE SOFTWARE 14 Lexington Road New City, NY 10956 (914) 634-1821 ajor Market: Software House **Target Applications: TRS-80** Machine Language Utilities
Net Sales: Less than \$100,000

Geographic Coverage: International Year Established: 1979 Number of Employees: 2 HUNTER & READY, INC.

445 Sherman Ave. Paio Alto, CA 94306 (415) 326-2950 Major Market: Software House; Dealer/Distributor Target Industries: Industrial; Avionics; Hermetics; Military Head of Marketing: James Ready Geographic Coverage: International Year Established: 1981 Number of Employees: 20

I P C TECHNOLOGY, LTD. 7336 Winthrop Road Thester, CT 06412 (203) 526-9574 Major Market: Communications **Equipment Manufacturing** Contacts: Head of Sales: Jerry Confer Head of Engineering: Lawerence Timmerman Year Established: 1974 Number of Employees: 700

IAS CORP. Mason Road No. 2 West Willington, CT 06279 (203) 429-1691 Major Market: Software House Contacts Head of Marketing: Frank Wincheul Head of Sales: Rob Sibley Year Established: 1982 Number of Employees: 4

IBM CORP. nmunications Products 44 S. Broadway White Plains, NY 10601 (914) 696-1900 Major Market: Terminal.

Communications Equipment and Office Equipment Manufacturing

### ICOT CORP.

830 Mauria Ave. Mountain View, CA 94043 (415) 964-4635 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Finance; Airlines Head of Marketing: Joe Becker Head of Sales: Bill Noonberg Head of Customer Service: Pete Geographic Coverage: International Year Established: 1968 Number of Employees: 250

IDE ASSOCIATES, INC.

7 Oak Park Dr. Bedford, MA 01730 (617) 275-4430 Major Market: Peripheral. Communications Equipment Manufacturing Contacts Head of Marketing: Nora Feldman Head of Sales: Jim Bender Head of Software: Nigel Watkins Head of Engineering: David Hunter Geographic Coverage: International Vear Established: 1982 Number of Employees: 25 IDEAS, INC.

10759 Tucker St. Beltsville, MD 20705 (301) 937-3600 Major Market: Component. Computer, Peripheral,

Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems): OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM): Dealer/Distributor: Training Simulators

Target industries: Government: Hospitals; Military
Target Applications: LAN; Communications: Remote Sensing Contacts

Head of Marketing: Barbara Duffy Head of Sales: Rod Matheson Head of Engineering: Dale Barrick Geographic Coverage: International Year Established: 1970 Number of Employees: 300

### IDEOGRAPHIX, INC.

532 Mercury Dr. Sunnvvale, CA 94086 (408) 739-1290 Major Market: Computer, Terminal, Peripheral and Communications Equipment Manufacturing: OEM (Computer Systems); OEM (Peripherals-Terminals); Syst House (Commercial OEM); Data Services (Service Bureau) Target Industries: Chinese DP; Chinese Communication Systems Target Applications: Chinese Data Entry; Chinese Telex Net Sales: \$1 Million - \$5 Million (1981)

Contacta

Head of Marketing: C. K. Yeh Head of Sales: Eric Wang Head of Software: David Chang Head of Engineering: Chan A. Yeh Head of Customer Service: George Tani

Geographic Coverage: Far East Year Established: 1972 Number of Employees: 55

IF SYSTEMS, INC. P.O. Box 359

98 Main St. Newmarket, NH 03857 (603) 659-5891 Major Market: Software House Target Industries: OEM Target Applications: Communications Contacts Head of Marketing: Susan Currier Geographic Coverage: International Year Established: 1981 Number of Employees: 17

ILENE INDUSTRIES DATA SYSTEMS, INC.

301 Stanley Blvd. Shelbyville, TN 37160 (615) 684-8731 Aajor Market: Computer, Communications Equipment Manufacturing Target Industries: Education Target Applications: Time-sharing; Real-time Contacts Head of Sales: John C. Smith Head of Software: Raymond Nix Head of Engineering: Donald J. Friedma Head of Customer Service: Rick Chambless Geographic Coverage: National Year Established: 1981

Number of Employees: 15 INDUSTRIAL COMPUTER CORP

Suite 1D 6810 Roswell Road Atlanta, GA 30328 (404) 396-9395 Major Market: Software House Contacts:

Head of Marketing: Mike Wells Head of Sales: Nancy Boyce Head of Software: Bill Masacre Geographic Coverage: International Year Established: 1980 Number of Employees: 10

INFINET, INC. Formerly Intertel, Inc. 6 Shattuck Road Andover, MA 01810 (617) 681-0600 Major Market: Communications Equipment Manufacturing

Target Applications: Network Contacts Head of Marketing: C. David Hetrick Head of Sales: Dick Murtland Head of Engineering: E. Cuddy Head of Customer Service: Greq

Geographic Coverage: International

Year Established: 1969 Number of Employees: 450

INFOLINK 1925 Holste Road Northbrook, IL 60062

(312) 291-2900 Major Market: Component, Terminal and Communications Equipment Manufacturing; Systems House (Commercial OEM) Target Industries: Manufacturing: Financial Target Applications: Factory Data Collection: Computer Voice Response Contacts: Head of Marketing: Paul Green Head of Engineering: Jim Lysaught

Year Established: 1976 Number of Employees: 60

INFOMEDIA CORR

Suite 275 801 Traeger Ave. San Bruno, CA 94066 (415) 952-4487 Major Market: Software House: Data Services (Service Bureau) Target Industries: Construction; Engineering; Utilities; Petroleum Contacts: Head of Marketing: Frank Mashburn Head of Sales: Ruth E. Smith Head of Software: Dr. Mel Pirtle Geographic Coverage: International Year Established: 1976 Number of Employees: 25

INFORMATION CONCEPTS, INC P.O. Box 18658

Dallas, TX 75218 (214) 324-2635 Major Market: Software House; Dealer/Distributor Net Sales: \$500,000 - \$1 Million Head of Marketing: Garry Goodwin Head of Engineering: K. Messina Geographic Coverage: International

Year Established: 1979 Number of Employees: 3 INFORMATION DEVICES

3205 Coronado Dr

Santa Clara, CA 95051 (408) 727-4347 Major Market: Terminal, Peripheral and Communications Equipment Manufacturing; OEM (Peripherals-Terminals): Systems House (Commercial OEM); Dealer/Distributor Target Industries: Engineering; Electronics Manufacturing: Scientific: Commercial Target Applications: Structures; CAD/CAM; Earth Sciences Contacts: Head of Marketing/Sales: Tom Melby Head of Software/Engineering: Irv Marriott Geographic Coverage: National Year Established: 1981 Number of Employees: 15

INFORMATION DYNAMICS

1251 Exchange St. 75081 Richardson TX (214) 783-8090 Major Market: Communications Equipment Manufacturing Contacts Head of Marketing: Charles Friedman Geographic Coverage: National Number of Employees: 5

INFORMATION MANAGEMENT TECHNOLOGIES 180 N. Michigan Ave. Chicago, IL 60601 (312) 372-4222 Major Market: Software House; Systems House (Commercial OEM) Target Industries: Banking: Manufacturing Target Applications: Financial; DBMS - Manufacturing; Cash Management; Message Store

Contacts: Head of Marketing: David Kaczmare Geographic Coverage: National Year Established: 1974 Number of Employees: 60

THE INFORMATION ORGANIZATION CORP.

Suite 308 2295 Vallejo St. San Francisco, CA 94123 (415) 921-3798 Major Market: Software House: Data Services (Service Bureau) Target Industries: Legal; Banking Target Applications: WP Net Sales: \$100,000 — \$500,000 (1981) Geographic Coverage: National Year Established: 1979 Number of Employees: 2

INFOSERVICES, INC.

1728 Montreal Circle Suite 22 Tucker, GA 30084 (404) 938-9960 Major Market: Software House; Systems House (Commercial OEM); Data Services (Service Bureau) Target Industries: Finance Target Applications: Financial; Income Tax Returns Net Sales: \$1 Million - \$5 Million (1981) Head of Marketing: Bob Westerman Head of Engineering: Craig Englis Geographic Coverage: Regional Year Established: 1969

Number of Employees: 17 INFOSOFT SYSTEMS, INC.

P.O. Box 640 80 Washington St Norwalk, CT 06856 (203) 866-8833 Major Market: Software House Net Sales: \$500,000 - \$1 Million (1982) Contacts Head of Marketing: Holly Lapinski Head of Sales: Jerrold H. Coret

Head of Software: Richard L. Roth Head of Customer Service: Peggy Herlihy

Geographic Coverage: International Year Established: 1979 Number of Employees: 10

### IMPOTRON SYSTEMS CORP. 9 North Olney

Cherry Hill Industrial Center Cherry Hill, NJ 08003 (609) 424-9400 Major Market: Communications **Equipment Manufacturing** Target Applications: Networking Systems (LAN); Data PBX; Network Control Management Contacts

Head of Marketing: Jeffrey Kraengel Head of Sales: Thomas Alexande Head of Engineering: Joseph O'Neill Head of Customer Service: Richard

Geographic Coverage: International Year Established: 1968 Number of Employees: 710

### INHOVATEK MICROSYSTEMS. INC. 12546

Smithfield Road

Millerton, NY

(914) 373-9003 Major Market: Component and Communications Equipment Manufacturing; Software House; Systems House (Commercial OEM) Target Industries: Manufacturing; Military Target Applications: Process Cantral Net Sales: \$100,000 -- \$500,000 (1981)Contacts: Head of Marketing: David Sherman Head of Sales: Paul Fitts Head of Software: Whaden N. Curtis Geographic Coverage: Regional Year Established: 1969

# INMOVATIVE ELECTRONICS.

Number of Employees: 8

4714 N. W. 165 St. Miami Fl 33014 (305) 624-1644 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Cross Industry Net Sales: \$1 Million - \$5 Million Contacts Head of Marketing: Shelly Dolan Head of Sales: Diane Ruggiero Head of Engineering: Matt Intihar Head of Customer Service: Ken Majersky Geographic Coverage: National

INVECOM, INC.

Year Established: 1977

Number of Employees: 28

601 inteCom Dr. Allen, TX 75002 (214) 727-9141 Mejor Market: Communications Equipment Manufacturing Target Industries: Corporations; Universities; Hospitals; Resale;

Shared Tenant Target Applications: LAN; Integrated Voice/Data; Voice Messaging: Protocol and Format Conversion Contacts: Head of Marketing/Sales: Tom Aschenbrenner Head of Engineering: Thomas

Head of Customer Service: Bob Stewart

Geographic Coverage: National Year Established: 1978 Number of Employees: 1,000

### INTEGRATED DESIGN ENGINEERING, INC.

P.O. Box 16307 St Louis MO 63125 (314) 343-0005 Major Market: Peripheral and Communications Equipment Manufacturing; OEM (Peripherals Terminals): Software House Target Industries: NCR Market Net Sales: \$500,000 - \$1 Million (1982)Contacts Head of Marketing/Engineering: Bill

Head of Customer Service: Steve Wolfangel Geographic Coverage: International

Year Established: 1979 Number of Employees: 10

### INTELLIGENT BUSINESS SYSTEMS, INC. 1500 Ocean Ave.

Bohemia, NY 11716 (516) 567-1800 Major Merket: Computer and Communications Equipment Manufacturing Target Industries: Record Carriers; Data/Telex Contacts: Head of Marketing: Malcolm Nagle Head of Software: Barry Muirhead Head of Engineering: Eric Schwartz Geographic Coverage: International Year Established: 1981 Number of Employees: 35

### INTELLIGENT TECHNOLOGIES INTERNATIONAL CORP.

151 University Ave. Palo Alto, CA 94301

(415) 328-2411

Major Market: Component and Communications Equipment Manufacturing; Software House: Systems House (Commercial OEM) Head of Marketing: Verlaine Crawford Head of Sales: David Voqel Head of Customer Service: Sharon Geographic Coverage: International Year Established: 1982 Number of Employees: 18

INTERACTIVE SYSTEMS/3M **Business Communication Products** 3920 Varsity Dr. Ann Arbor, MI 48104 (313) 973-1500

Major Market: Communications **Equipment Manufacturing** Target Industries: Manufacturing: Education; Financial; Government Target Applications: LAN Head of Marketing: Dan Gahlon Head of Sales: John Huber Head of Software: Bob Wolters Head of Engineering: Brian Hackett Geographic Coverage: International Year Established: 1969 Number of Employees: 110

### INTERBUSINESS CORP.

Suite E

115 N. Wolf Road Wheeling, IL 60090 (312) 459-8866 Major Market: Component Manufacturing; Peripheral Manufacturing; Communications Equipment Manufacturing; Dealer/Distributor Target Applications: Data Contactor Head of Marketing: Mike Tournavan Head of Engineering: John Todero Head of Customer Service: John Geographic Coverage: National Year Established: 1981

Number of Employees: 41 INTERCON RESEARCH CORP.

Suite 14 2603 Artie St. Huntsville, AL 35805 (205) 536-6686 Major Market: Communications Equipment Manufacturing: Dealer/Distributor Target Industries: Government; Aerospace; Nuclear; Insurance Contacts Head of Marketing/Sales: C. Lyndon Martin Head of Engineering: Roy Phillips Geographic Coverage: Regional Year Established: 1977 Number of Employees: 10

### INTERCONNECT PLANNING CORP.

Wall St. Plaza New York, NY 10005 (212) 825-9060 Major Market: Communications Equipment Manufacturing Target Industries: Banking; Stock Brokerage; Insurance Target Applications: Trading Contr Head of Marketing: Edward F. McGrath Head of Engineering: Harry Bergen Head of Customer Service: Acelia Hannson

Geographic Coverage: International Year Established: 1974 Number of Employees: 450 INTERFACE ELECTRONICS.

INC. 21134 Bridge St. Southfield, MI 48034 (313) 352-8820

Major Market: Communications Equipment Manufacturing; Software House: Systems House (Commercial OEM); Dealer/Distributor Net Sales: \$500,000 - \$1 Million (1981) Contacts: Head of Marketing: Katan Bakshi Head of Software: Sunil Shah Head of Engineering: Alan Barman Geographic Coverage: National Year Established: 1974 Number of Employees: 20

INTERLAN, INC. 3 Liberty Way Westford, MA 01886 (617) 692-3900 Major Market: Component, Peripheral and Communications Equipment Manufacturing; Software House; Data Services (Service Bureau) Target Industries: OEM; Computer Companies Target Applications: CAD/CAM; Automatic Testing; R&D Contacts Head of Marketing: Jerry Wesel

Head of Sales: George Symula Head of Engineering: Ray Moore Geographic Coverage: International Year Established: 1981 Number of Employees: 100

INTER-LINK

Suite 1 580 Weddell Dr. Sunnyvale, CA 94089 (408) 744-1930 Major Market: Communications Equipment Manufacturing: OEM (Computer Systems): OEM (Peripherals-Terminals); Systems House (Commercial OEM); Dealer/Distributor Contacts: Head of Marketing/Sales: Bill Rubin Head of Engineering: Ken Larsen Head of Customer Service: Dave Russell Geographic Coverage: National

Year Established: 1969 Number of Employees: 25

INTERMETRICS

733 Concord Ave. Cambridge, MA 02138 Major Market: Software House Geographic Coverage: National Year Established: 1969 Number of Employees: 400

INTERNATIONAL DATA SCIENCES, INC.

Corporate Headquarters 7 Wellington Road Lincoln Bl 02865 (401) 333-6200 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Engineering; Banking; Military; Aviation Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Jack Simpson Head of Sales: T. J. Daniels

Head of Engineering: Ed Salzillo Geographic Coverage: International Year Established: 1968 ber of Employees: 150

# INTERNATIONAL DIGITAL

ELECTRONICS ASSOCIATES 6 Westchester Plaza Elmsford, NY 10523 (914) 347-3700 Major Market: Terminal Manufacturing; Software House; Systems House (Commercial OEM) Target Industries: Communications
Target Applications: Communications Head of Marketing: Charles T. Reilly Geographic Coverage: International Year Established: 1979 Number of Employees: 25

### INTERNATIONAL MODEM EXCHANGE (TIMECOR)

P.O. Box 8928 Suite 905 4 Longfellow Place Boston, MA 02114 (617) 720-4090 Major Market: Communications **Equipment Manufacturing** Number of Employees: 10

### INTERSIL SYSTEMS, INC.

1275 Hammerwood Ave. Sunnyvale, CA 94089 (408) 743-4300 Major Market: Component, Computer, Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals): Software House; Systems House (Commercial OEM); Dealer/Distributor Target Industries: System Integrators: Large Company In-House Communications; Industrial Control; IBM PC Target Applications: Factory Automation; OA; DP Contacts: Head of Marketing: Lee Jensen Head of Software: Craig Erickson Geographic Coverage: International Year Established: 1968 Number of Employees: 200

### ITEK COMPOSITION SYSTEMS

34 Sellu Dr. Nashua, NH 03063 (603) 889-1400 Major Market: Component, Computer, Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing; Dealer/Distributor Target Industries: Publishing: Media; Office Systems Target Applications: Typsetting; Data Conversion Contacts Head of Marketing: William Head of Sales: Bill Kelly Head of Engineering: Edward

Geographic Coverage: International Year Established: 1976 Number of Employees: 600

# ITT BUSINESS

COMMUNICATIONS CORP. 300 E. Park Dr. Harrisburg, PA 17111 (717) 564-4343 Major Market: Communications Equipment Manufacturing: Dealer/Distributor Target Industries: Fortune 1000 **Target Applications:** Communications Head of Marketing: Mike Hickey Head of Sales: Terry Price

# ITT TELECOM PRODUCTS.

3100 Highwoods Blvd. Raleigh, NC 27604 (919) 872-3759 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing; Software House Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target industries: Telephone; Cellular Radio: Business: Industrial Target Applications: Switching: sion; Data; Instrumentation Contacts: Head of Marketing: Ken Ray Head of Software: W.L. Glomb Head of Customer Service: George Young Jr. Geographic Coverage: International Year Established: 1983 Number of Employees: 8,500

IWATSU AMERICA, INC. 120 Commerce Road Carlstadt, NJ 07072 (201) 935-8580 Major Market: Communications Equipment Manufacturing; Software House Head of Marketing: Dan Mahoney Head of Sales: Charles Rolland Geographic Coverage: International Year Established: 1938 Number of Employees: 40

## J B M ELECTRONICS

6020 N. Lingbeergh Blvd. Hagelwood, MS 63042 (314) 731-7781 Major Market: Communications Equipment Manufacturing Target Industries: Telecommunications Contacts Head of Marketing: Steve Mintz Head of Software: James Harrisson Head of Engineering: Irwin Mintz Veer Established: 1975 Number of Employees: 53

### JC SYSTEMS

469 Valley Way Milpitas, CA 95035 (408) 945-0318 Major Market: Component, Computer and Communications Equipment Manufacturing; Software House Target Industries: Manufacturing: Engineering; Offices; Education

Target Applications: Data Communications; WP; DBMS Net Sales: \$500,000 - \$1 Million

Head of Marketing: Yung Choi Head of Engineering: Jai Choi Head of Customer Service: Dave

Geographic Coverage: International Year Established: 1978 Number of Employees: 10

### KAPUSI LABORATORIES 2121 S. El Camino Rea

San Mateo, CA 94403 (415) 573-5475 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: John J. Kapusi Geographic Coverage: Intel Year Established: 1972 Number of Employees: 10

## KAUFMAN RESEARCH

MANUFACTURING, INC. 145 E. Dana St. Mountain View, CA 94041 (415) 962-8811 Major Market: Communications **Equipment Manufacturing** Target Applications: Protocol Conversion; Data Communications Net Sales: \$1 Million -- \$5 Million Contacts Head of Marketing: Marc T. Kaufman Geographic Coverage: International Year Established: 1978

### Number of Employees: 17 KEYBROOK BUSINESS SYSTEMS, INC. 2035 National Ave

Hayward, CA 94545 (415) 887-8999 Major Market: Computer Manufacturing; Peripheral Manufacturing; OEM (Computer Systems): OEM (Peripherals-Terminals); Software House Target industries: Fortune 1000; Government; Education; Small Rusiness Head of Marketing: Don Gallagher Head of Software: John Row Head of Engineering: J. Rogers Geographic Coverage: International Year Established: 1979 Number of Employees: 12

### KEYSTONE DATA CONSULTANTS, INC.

24 E. Princess St. P.O. Box 606 York, PA 17405 Major Market: Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Industries: Manufacturing; Engineering

Target Applications: POS; Accounting; Inventory Management; Industry Control Net Sales: \$100,000 — \$500,000 (1981)Geographic Coverage: International Year Established: 1977 Number of Employees: 6

# KINEX CORP. 6950 Bryan Dairy Road Largo, FL 33543

(813) 541-6404 Major Market: Communications **Equipment Manufacturing** Contacts Head of Marketing: Bill Huston Head of Sales: S.F. Ridge Head of Software: G. Michalac Head of Engineering: K.I. Nordling Head of Customer Service: T. Porter Geographic Coverage: National Year Established: 1977 Number of Employees: 75

### KMW SYSTEMS CORP.

8307 Highway 71 W. Austin, TX 78735 (512) 288-1453 Major Market: Computer, Peripheral, Communications Equipment and Interface Manufacturing Target Industries: Geophysical; **Target Applications:** Communication: Graphics: Channel

Interfacing Head of Marketing: Fred Klingensmith Head of Sales: Steve Stillman Head of Software: Harry D. Keims Head of Engineering: Thomas Allen Head of Customer Service: Karen

Willey Geographic Coverage: International Year Established: 1975 Number of Employees: 60

### LEADING EDGE PRODUCTS, INC.

221 Tumpike St. Canton, MA 02021 (617) 828-8150 Major Market: Peripheral Manufacturing; Dealer/Distributor Target Industries: System Houses; Computer Retail Stores Target Applications: Accounting; Games: Education Contacts Head of Marketing: William Sellers Geographic Coverage: International Year Established: 1979 Number of Employees: 160

# LEARNED-MAHN

2229 W. State St. P.O. Box 1488 Boise, ID 83701 (208) 336-2281 Major Market: Software House Target Industries: Utilities; Nonprofit Target Applications: Accounting Net Sales: \$100,000 — \$500,000 (1981) Head of Sales: Gary Mahn

Head of Customer Service: David

Neyland

Sinnott

Head of Software: Nancy Learned Head of Customer Service: Gary Mahn

Geographic Coverage: International Year Established: 1973 Number of Employees: 10

LED SYSTEMS, INC.

1006 Apache Trail Mechanicsburg, PA 17055 (717) 697-2607 Major Market: Communications Equipment Manufacturing Target Industries: Government; Education; Industry; Telephone Target Applications: Data Contacts Head of Marketing: Ralph Cleveland Year Established: 1979 Number of Employees: 10

LEGIST AUTOMATION, INC. 1212 Millbrook Dr. Arlington, TX 76012 (817) 274-0089 Major Market: Software House

Head of Marketing: Judy Carrick Geographic Coverage: International Year Established: 1980 Number of Employees: 3

LENCOM SYSTEMS, INC.

2104 W. Peoria Ave Phoenix, AZ 85029 (602) 944-1543 Major Market: Communications Equipment Manufacturing Net Sales: \$1 Million - \$5 Million (1982) Contacts Head of Marketing: Terry Siegrist Head of Engineering: Phil Jalov Geographic Coverage: International Year Established: 1976 Number of Employees: 45

LEXICON CORP. OF MIAMI 1541 N.W. 65th Ave.

Fort Lauderdale, FL 33313 (305) 792-4400 Major Market: Terminal and Communications Equipment Manufacturing Target Industries: Fortune 1000 Target Applications: Order Entry; Electronic Mail Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Chris Washburn Geographic Coverage: International Year Established: 1976 Number of Employees: 42

LINDBERGH SYSTEMS

41 Fairhill Road Holden, MA 01520 (617) 852-0233 Major Market: Software House Not Sales: \$100 000 --- \$500 000 (1981) Head of Sales: Alison Wilson Head of Software: Dave Lindbergh Geographic Coverage: International Year Established: 1980 Number of Employees: 3

LINK SYSTEMS

1640 19th St. Santa Monica, CA 90404 (213) 453-1851 Major Market: Software House Net Sales: \$1 Million - \$5 Million (1981) Contacts: Head of Sales: Rick Gibson Head of Engineering: Curt Bianchi Geographic Coverage: International Year Established: 1980

LOCAL DATA, INC.

2701 Toledo St. Torrance CA 90503 (213) 320-7126 Major Market: Communications Equipment Manufacturing
Net Sales: \$1 Million — \$5 Million (1982) Contacts Head of Sales: Dave Guthrie Head of Engineering: Dennis Klein Head of Customer Service: Kevin Geographic Coverage: International Year Established: 1977

Number of Employees: 50

LOGICA, INC. 666 3rd Ave., 19th Floor New York, NY 10017 (212) 599-0828 Major Market: Communications Equipment Manufacturing; Software House; Systems House (Commercial Target Industries: Banking: Telecommunications; Defense: Space Target Applications: Message Switching; Communications; System

Design Contacts: Head of Marketing: William Head of Sales: Bob Wisniewski Geographic Coverage: International Year Established: 1968

Number of Employees: 1,500 LYNCH COMMUNICATION SYSTEMS, INC.

**Data Division** 204 Edison Way Reno, NV 89520 (702) 785-8680 Major Market: Communications Equipment Manufacturing; Dealer/Distributor Target Applications: Data Communications Contacts Head of Marketing: Alexander A. Mauronides Geographic Coverage: International Year Established: 1945 Number of Employees: 1,000

M/A-COM DCC, INC. 11717 Exploration Lane Germantown, MD 20874-2799

(301) 428-5500 Major Market: Communications **Equipment Manufacturing** Target Industries: Banking; Law; Universities; Government

Target Applications: Data Communications Contacts Head of Marketing: Cathy Jenkins Head of Sales: Garland Audilet Geographic Coverage: International Year Established: 1971 Number of Employees: 900

M/A-COM, INC.

Linkabit 3033 Science Park Road San Diego, CA 92121 (619) 457-2340 Major Market: Communications Equipment Manufacturing Target Industries: Satellite nunications; Government; Cable; Broadcasting; Banking Contacts: Head of Marketing: Mike Lubin Head of Engineering: Tom Seay Geographic Coverage: International Year Established: 1968 Number of Employees: 1,300

MACKINNEY SYSTEMS Box 270A Fair Grove, MO 65648 (417) 833-9553 Major Market: Software House Net Sales: Less than \$100,000 (1981)

Geographic Coverage: International Year Established: 1978 Number of Employees: 3

MADZAR CORP. 37490 Gienmoor Dr. Fremont, CA 94536 (415) 794-7400 Major Market: Communications Equipment Manufacturing Head of Marketing: Donald H. Platt Geographic Coverage: International Year Established: 1979

Number of Employees: 5

MAGNUM COMMUNICATIONS.

LTD Suite 415 320 Interstate N. Atlanta, GA 30339 (404) 952-4940 Major Market: Communications Equipment Manufacturing; Software House; Systems House (Commercial OEM) Target Industries: Credit Unions: Banking; Retail; Finance Target Applications: Credit Reports; New Accounts Net Sales: \$100,000 - \$500,000 Contacts: Head of Marketing: Sue Knautz Head of Software: Lindsey Gardener

P.O. Box 175 Chicopee, MA (413) 598-8204 Major Market: Communications

Geographic Coverage: National Year Established: 1978

Number of Employees: 13

MANAGE, INC.

Equipment Manufacturing Target Industries: Banking; Retail; Engineering Contacts: Head of Marketing: Linda Menard Head of Sales: David P. Menard Geographic Coverage: National Year Established: 1973 Number of Employees: 30

MATH ASSOCIATES, INC. 2200 Shames Dr. Westberry, NY 11590 (516) 334-6800 Major Market: Component. Peripheral and Communications Equipment Manufacturing; Custom Communications Fourinms Contacts Head of Marketing: Bob DeLia Head of Sales: Norman Fein Head of Engineering: Irwin Math Geographic Coverage: Western Europe Year Established: 1972 Number of Employees: 30

MATHEMATICA PRODUCTS GROUP, INC.

P.O. Box 2392 Princeton, NJ 08540 (609) 799-2600 Major Market: Software House Contacta: Head of Marketing: Paul Grabsheid Head of Sales: Mark Berkowitz Head of Software: Bernard Finzi Geographic Coverage: International Year Established: 1975 Number of Employees: 200

MCCORMACK & DODGE

560 Hillside Ave. Needham, MA 02194 (617) 449-4012 ajor Market: Software House Target Applications: Financial; Accounting Contacts Head of Marketing: Robert Weiler Head of Sales: Steven Weinburg Head of Engineering: John Landry Geographic Coverage: International Year Established: 1969 Number of Employees: 400

MCDONNELL DOUGLAS AUTOMATION CO. P.O. Box 516 St. Louis, MO 63166 (314) 233-4718 Major Market: Software House; Systems House (Commercial OEM); Data Services (Service Bureau) Target Industries: Medical Target Applications: Financial Systems; Data Collection; Patient Care Reporting Head of Marketing: Edward V. Hamilton .lr Head of Sales: Arthur M. Randall Head of Software: Philip Kreted Head of Engineering: William T Convin Head of Customer Service: Joseph P. Sullivan Geographic Coverage: International Year Established: 1970 Number of Employees: 1,000

MCM ENTERPRISES 215 Hamilton Ave

Palo Alto, CA 94301 (415) 327-8080 Major Market: OEM (Computer Systems); Software House Net Sales: \$100,000 - \$500,000

(1981) Geographic Coverage: International Year Established: 1977 Number of Employees: 5

# MEGADATA CORP.

35 Orville Dr. Bohemia, NY 11716 (516) 589-6800 Major Market: Computer and Office Equipment Manufacturing Net Sales: \$1 Million - \$5 Million (1982) Contacts: Head of Marketing: Richard Adams Geographic Coverage: International Year Established: 1967 Number of Employees: 150

MEGAWEST SYSTEMS, INC.

Suite 224 140 W. 2100 S. Salt Lake City, UT 84115 (801) 487-0788 Major Market: OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Medical; Retail; Accounting: Trucking
Geographic Coverage: International
Year Established: 1979
Number of Employees: 10

MELCO LABS. INC. 14408 N.E. 20th St Bellevue, WA 98007 (206) 643-3400 Major Market: Communications Equipment Manufacturing Target Industries: Telephone Contacts

Head of Customer Service: Kay Year Established: 1973 Number of Employees: 250

MEMOREX CORP.

Conta

Santomas and Central Expressways Santa Clara, CA 95052 (408) 987-1000 Major Market: Terminal, Peripheral and Communications Equipment Manufacturing; Systems House (Commercial OEM); Dealer/Distributor Target Industries: Fortune 1000

Head of Marketing: Dennis Flanagan Head of Sales: Sam Spadafora Head of Engineering: Lou Debartelo Head of Customer Service: Robert Berry

Geographic Coverage: International Year Established: 1961 Number of Employees: 10,000

MERIDIAN TECHNICAL ASSOCIATES, INC. 2 Southboro Lane

Glenrock, NJ 07452 (201) 445-8645 Major Market: Communications Equipment Manufacturing; Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Industries: Data Communications: Business: Micro Head of Marketing: J. Fitzpatrick Year Established: 1980 Number of Employees: 3

METAPATH, INC. 737 Lincoln Centre Dr. Forest City, CA 94404 (415) 345-7700 Target Industries: Data nunications Target Applications: Terminal Switching to HP and DEC Head of Marketing: Tom Cramer Year Established: 1983 Number of Employees: 30

MFJ ENTERPRISES

P.O. Box 494 Starkeville MS 39762 (601) 323-5869 Major Market: Communications Equipment Manufacturing; Software House Year Established: 1972 Number of Employees: 75

MICOM SYSTEMS Micro-Baud Systems, Inc. 3393 Delacruz Blvd. Santa Clara, CA 95050-2263 (408) 727-5275 Major Market: Communications Equipment Manufacturing Target Industries: OEM Terminal and OEM Computer Manufacturing; End Users (Bell 212); Distributors (Stand-Alone)

Target Applications: Moderns Net Sales: \$1 Million - \$5 Million (1982)Conta

Head of Marketing: Bob Taylor Head of Sales: Joseph Gaynor Head of Software: Stan Fickes Head of Engineering: Lucian Dang Geographic Coverage: National Year Established: 1980 Number of Employees: 30

MICOM SYSTEMS.

20151 Nordhoff St. Chatsworth, CA 91311 (213) 998-8844 Major Market: Communications Equipment Manufacturing Head of Marketing: Steve Frankel Head of Sales: Chris Kenber Geographic Coverage: International Year Established: 1973 Number of Employees: 1,200

MICRO-INTEGRATION, INC. 63 Maple St. P.O. Box 335 Friendsville, MD 21531

(301) 746-5888 Major Market: Software House Target Applications: Micro Data Communications Net Sales: \$500,000 - \$1 Million Contacts Head of Marketing: Max Eveleth

Head of Sales: Kelly Wiseman Head of Software: Frank Ross Head of Engineering: Emie Nichols Head of Customer Service: Marsha Shank Geographic Coverage: International Year Established: 1978 Number of Employees: 15

THE MICROPERIPHERAL CORP

2565 152nd Ave. N.E. Redmond, WA 98052 (206) 881-7544 Major Market: Communications Equipment Manufacturing; Software House Target Applications: Data Communications;

**Telecommunications** Contacts: Head of Marketing: Noreen Scott Geographic Coverage: International Year Established: 1978 Number of Employees: 50

MICRO-SYSTEMS SOFTWARE.

4301-18 Oak Circle Boca Raton, FL 33431 (305) 391-5033 Major Market: Software House Net Sales: \$500,000 - \$1 Million (1981)Contacts Head of Sales: Chris Walczak Geographic Coverage: International Year Established: 1979 Number of Employees: 13

MICRO/MACRO SYSTEMS,

10 Columbus Circle 25th Floor New York, NY 10019 (212) 246-4242 Major Market: Software House Systems House (Commercial OEM); Dealer/Distributor Target Industries: Direct Mail; Construction: Financial: Contractors Target Applications: Accounting; Graphics; Scientific Data Acquisition; Payroll Net Sales: \$1 Million - \$5 Million Contacts

Head of Sales: Gerald Greenberg Geographic Coverage: National Year Established: 1968 Number of Employees: 30

MICROCOM, INC. 1400-A Providence Highway

Norwood, MA 02062 (617) 762-9310 Major Market: Communications Equipment Manufacturing Contacts:

Head of Sales: Harry Segal Geographic Coverage: Regional

Year Established: 1980 Number of Employees: 70

MICROCOSYM, INC. Suite 102

6055 Lehman Dr. Colorado Springs, CO 80907 (303) 504-9241 Major Market: Communications Equipment Manufacturing Target Industries: Computer Target Applications: Honeywell Large Systems Communications Net Sales: \$100,000 - \$500,000 (1981) Contacts Head of Marketing: Kurt M. Frisbie Head of Software: Bruce Trowbridge Geographic Coverage: National Year Established: 1976 Number of Employees: 2

MICRODATA CORP. 4000 McArthur P.O. Box 19501 Irvine, CA 92713 (714) 250-1000 Major Market: Computer, Terminal. Peripheral and Communications Equipment Manufacturing Contacts: Head of Marketing: Bob Purdy Geographic Coverage: International Year Established: 1969 Number of Employees: 3,000

MICROLOG, INC. 222 Rte. 59 Suffern NY 10901 (914) 368-0353 Major Market: Component and Communications Equipment Manufacturing Target Industries: Government; Banking; Insurance Contacts: Head of Marketing: Andrew Watson Geographic Coverage: National Year Established: 1981

MICRON, INC. 10045 Waterford Dr Ellicott City, MD 21043 (301) 461-2721 Major Market: Software House Geographic Coverage: National Year Established: 1975 Number of Employees: 3

Number of Employees: 35

MICROSPARC, INC.

10 Lewis St. Lincoln, MA 01773 (617) 259-9710 Major Market: Software House Target Industries: Personal Computers Net Sales: \$1 Million - \$5 Million (1982) Contacts Head of Marketing: David P. Szetela Head of Sales: Tammy J. Arico Geographic Coverage: International Year Established: 1980 Number of Employees: 15

MICROSTUF, INC. Suite 140 1845 The Exchange

Atlanta GA 30339 (404) 952-0267 Major Market: Software House **Target Applications: Data** Communications Geographic Coverage: National Year Established: 1979 Number of Employees: 12

### MIDWEST DATA SOURCE

1010 Nimetz Cincinnati, OH 45230 (513) 231-2023 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: James Jepson Head of Softwars: Mike Shier Head of Engineering: William Miller Head of Customer Service: Barbara Railey Geographic Coverage: International Year Established: 1980 Number of Employees: 7

### MINNTRONICS CORP.

2599 White Bear Ave St Paul MN 55109 (612) 770-5247 Major Market: Peripheral and Communications Equipment Manufacturing
Target Industries: Banking; Military; Education: Commercial Contacts: Head of Sales: Jim Cobb Head of Engineering: Deane Ries Head of Customer Service: Shona Geographic Coverage: International Year Established: 1975

### MITTEL INC.

Mittel Seminanductor Division 5400 Broken Sound Blvd. Boca Raton, FL 33431 (305) 994-8588 Major Market: Component. Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Dealer/Distributor Target Industries: Telecommunications Contacts: Head of Sales: Gordon Turner Head of Engineering: Tom Mayer Geographic Coverage: National Year Established: 1971

### MITSUBISHI ELECTRONICS AMERICA, INC.

Computer Division 991 Knox St. Torrance, CA 90502 (213) 515-3993 Major Market: Computer, Terminal and Peripheral Manufacturing: OEM (Computer Systems); Software House, Dealer/Distributor Target Industries: Manufacturing; Contractors Target Applications: Accounting: Data Entry Geographic Coverage: National Year Established: 1976 Number of Employees: 100

MODEMS PLUS, INC. 217 F. Trinity Place P.O. Box 1727 Decatur, GA 30030 (404) 378-5276 Major Market: Communications Equipment Manufacturing: OEM (Computer Systems); OEM (Peripherals-Terminals); Systems House (Commercial OEM);

Dealer/Distributor

Net Sales: \$1 Million - \$5 Million (1982) Contac Head of Engineering: Tom Young Geographic Coverage: International Year Established: 1971 Number of Employees: 20

MODULAR COMPUTER SYSTEMS, INC. (MODCOMP) 1650 W. McNab Road

Ft. Lauderdale, FL 33310 (305) 974-1380 Major Market: Computer Manufacturing; Communications Fouinment Manufacturing: Systems House (Commercial OEM) Target Industries: Process Control; Communications; Viewdata; Factory Automation Target Applications: Process Control; Energy Management; Discrete Manufacturing Contacte Head of Marketing: Philippe Courtot Head of Sales: Howard Kossack Head of Engineering: Harold Koplow Head of Customer Service: Ken Estey Geographic Coverage: International Year Established: 1970 Number of Employees: 1,500

### MODULAR INTEGRATION, INC. Suite 1 **Building C**

1145 12th Ave N W

P.O. Box 1079

Issaquah, WA 98027 (206) 392-8086 Major Market: OEM (Computer Systems) Target Industries: Water/ **Target Applications: Process** Control Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Jane Kunkos Head of Sales: James Wooten Head of Customer Service: Jane

Geographic Coverage: International Year Established: 1977 Number of Employees: 11

# **MOHAWK DATA SCIENCES**

CORP. Seven Century Dr. Parsippany, NJ 07054 (201) 540-9080 Major Market: Computer, Terminal and Peripheral Manufacturing; Software House Target Industries: Hospitals; Hospitality; Retail Footwear; Motor Vehicle

Head of Marketing: Brian S. Gaylord Geographic Coverage: International Year Established: 1964 Number of Employees: 5,300

# MONROE SYSTEMS FOR

BUSINESS Litton Industries, Inc. The American Board P.O. Box 9000R Morris Plains, NJ 07950 (201) 540-7300 Major Market: Computer and Office Equipment Manufacturing; OEM (Computer Systems); Software House Target Industries: Banking; Accounting Target Applications: Financial

Head of Marketing: Robert McGrath

Geographic Coverage: International Year Established: 1912

Number of Employees: 3,300 MORGAN DATA SYSTEMS

233 Racetrack Road Fort Walton Beach, CA 32548 (904) 863-2124 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems); Manufacturing Special Systems Target Industries: Communications **Target Applications:** Instrumentation; Control; Monitoring; **Data Acquisition** Contacts Head of Marketing: Constantine Dudek

Head of Customer Service: David Johnson Geographic Coverage: National Year Established: 1971

Number of Employees: 8

MOTOROLA, INC. 1301 E. Algonquin Road Schaumburg, IL 60196 (312) 576-7000 Major Market: Component, Computer, Terminal, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Systems House (Commercial OEM): Data Services (Service Bureau): Dealer/Distributor Target Industries: Public Safety; Industria; Oil; Mass Transit Target Applications: Security; Motor Vehicle Efficiency; Hospital Paging; Personnel Communications Contacts: Head of Marketing: Bob Cecil Head of Sales: Art Sundry Head of Customer Service: Ira Walker

Geographic Coverage: International Year Established: 1928 Number of Employees: 75,000 MOUNTAIN COMPUTER, INC.

300 El Pueblo Road Scotts Valley, CA 95066 (408) 438-6650 Major Market: Peripheral. Communications Equipment and Office Equipment Manufacturing: OEM (Peripherals-Terminals); Dealer/Distributor; Storage System Target Applications: Data Entry; Communications; Storage System Net Sales: \$1 Million - \$5 Million Contacts

Head of Marketing: Robert Stroh Head of Software: George Proper Head of Engineering: Eric Swartz Head of Customer Service: Stan Scardino

Geographic Coverage: International Year Established: 1977 Number of Employees: 120

MTI SYSTEMS CORP. 38 Harbor Park Dr. P.O. Box 271 Port Washington, NY 11050 (516) 621-6200 Major Market: OEM (Computer Systems): Dealer/Distributor: Target Industries: Fortune 500; Education; Banking; OEM Net Sales: \$1 Million - \$5 Million (1981) Contacts: Head of Marketing: Bert Rudofsky Head of Customer Service: Joe Morreale Geographic Coverage: Regional Year Established: 1968 Number of Employees: 55

MUIRHEAD, INC.

1101 Bristol Road Mountainside, NJ 07092 (201) 233-6010 Major Market: Communications Equipment Manufacturing Target Industries: Utilities; Common Carriers; Oil Companies; Publishers Target Applications: Printing; Data Communications Contacts Head of Marketing: Holmes Bailey Head of Engineering: Jason Eveleth Geographic Coverage: International Year Established: 1954

# Number of Employees: 80 MULTI - TECH SYSTEMS.

82 2nd Ave. S.E. New Brighton, MN 55112 (612) 631-3550 Major Market: Computer and Communications Equipment Manufacturing; OEM (Computer Systems) Target Industries: Retail; End User Target Applications: WP: Accounting; MRP; List Management Head of Marketing: Thomas Head of Engineering: Greg Johnson Head of Customer Service: Pete Hanlon Geographic Coverage: National Year Established: 1970 Number of Employees: 50

MULTITRONICS, INC. Industrial Products Divisions 6444 Sierra Court

P.O. Box 2295
Dublin, CA 94568
(415) 829-3300
Major Market: Computer and
Communications Equipment
Manufacturing; OEM (Computer
Systems); OEM (PeripheralsTerminals); Software House;
Systems House; Commercial OEM)
Target Industries: System House;
System Integration; Process Control;
Water/Wasterives: Type Thouse;
Target Applications: Data
Acquisition; Water Distribution
Control; Process Control
Net Sales: \$1 Million - \$5 Million
(1981)
Let Sales: \$1 Million - \$5 Million
(1981)
Head of Marketing: Warren McGuffin
Head of Marketing: Warren McGuffin
Head of Marketing: Warren McGuffin
Head of Sales: Bill Cox

Head of Engineering: Torn Seabury Head of Customer Service: Roy Weaver Geographic Coverage: National Year Established: 1970 Number of Employees: 200

Head of Software: James Hays

MUMFORD MICRO SYSTEMS
P.O. Box 400
Summerland, CA 93067
(805) 969-4557
Major Market: Software House
Contacts:
Head of Marketing: Peter Burns
Geographic Coverage: International
Year Established: 1979
Number of Employees: 5

H.F. SYSTEMS, LTD.
P.O. Box 76363
Atianta, GA 30358
(404) 252-3302
Major Market: Software House
Net Sales: \$100,000 - \$500,000
(1982)

(1982) Geographic Coverage: Canada Year Established: 1981 Number of Employees: 2

NATIONAL COMPUTER SYSTEMS, INC. Scanning Products Division 4401 W. 76th St. P.O. Box 9365 Minneapolis, MN 55440 (612) 830-7600 Major Market: Component, Terminal, Peripheral and Communications Equipment Manufacturing; OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM); Dealer/Distributor Target Industries: Education; Human Resources; Government; Clinical Target Applications: OMR; Data Contacts: Head of Marketing: Gene Courtney

Head of Engineering: L. Sanderson Head of Customer Service: J. Lockner

Head of Sales: John Kirchner

Head of Software: Laurence

Geographic Coverage: International Year Established: 1962 Number of Employees: 1,300

MATIONAL E.F.T, IMC, Systems Development 89 Jefferson Blvd. Warwick, RI 02888 (401) 781-3850 (tware House; Systems House (Commercial OEM) Target Industries: Manufacturing; Government; Banking Net Sales: \$1 Million - \$5 Million (1981) Contacta: Head of Marketing: Donald Kennedy Head of Software: Donald R.

Head of Customer Service: Robert Peluso Geographic Coverage: Regional Year Established: 1976 Number of Employees: 62

MATIONAL MICRO PRODUCTS, INC.
430 Southlake Blvd. Richmond, VA 23236 (804) 794-055 (70 puter and Communications Equipment Manufacturing; OEM (Computer Systems) Systems House (Commercial OEM); Dealer/Distributor Target Industries: Small Business; Lodging; Security Target Applications: Office Networks; Process Control Net Sales: \$100,000 - \$500,000 (1981)

Contacts: Head of Marketing: Carol Nugent Head of Engineering: Stan Demster Geographic Coverage: National Year Established: 1980 Number of Employees: 14

NATIONAL PRODUCTS MARKETING, INC.

Suite 234
2 Northside 77
Atlanta, GA 30318
(800) 241-1170
Contiacts
Head of Marketing/Sales: Elizabeth
Addison
Head of Engineering/Software: Joe
Hale
Geographic Coverage:
Year Established; 1982
Number of Empioyees: 30

NATIONAL SEMICONDUCTOR

2900 Semiconductor Dr.
2900 Semiconductor Dr.
Santa Clara, CA 95051
(408) 721-5000
Major Market: Component,
Computer, Terminal, Peripheral and
Communications Equipment
Manufacturing: Software House;
Systems House (Commercial of EM);
Dealer/Distributor; Special Systems
Target Industries: Military
Contacts:
Head of Marketing: F. J. Van Popelen
Geographic Coverage: International

Year Established: 1965 Number of Employees: 35,000

NBI, INC. 3450 Mitchell Lane P.O. Box 9001 Boulder, CO 80301 (303) 444-5710 Major Market: Communications Equipment and Office Equipment Manufacturing: Software House Target Industries: Administrative; Finance; Manufacturing; Engineering/Scientific Target Applications: OA Head of Marketing: Rob Reid Head of Sales: Mark Stevenson Geographic Coverage: International Year Established: 1973 Number of Employees: 1.300

NCR COMTEN, INC. 2700 Snelling Ave. N. St. Paul. MN 55113 (612) 638-7777 lajor Market: Computer and Communications Equipment Manufacturing; Software House Target Industries: Finance; ecommunications; Retail; Oil Industry Target Applications: Networking: Telecommunications Head of Marketing: V. W. Yates Head of Sales: R. E. Oldenberg Head of Software: R. M. Groenke Head of Engineering: G. Iverson Head of Customer Service: L. Ackerman Geographic Coverage: International Year Established: 1968 Number of Employees: 2,200

NCR CORP. World Headquarters 1700 S. Patterson Blvd. Dayton, OH 45479 (513) 445-5000 Major Market: Component. Computer, Terminal, Peripheral Communications Equipment and Office Equipment Manufacturing: Software House; Systems House (Commercial OEM); Data Services (Service Bureau) Target Industries: Retail; Banking; Commercial/Industrial; Medical Education; Governme Target Applications: Transaction Processing Contacts Head of Customer Service: V. F. Geographic Coverage: International Year Established: 1884 Number of Employees: 63,000

532 Broad Hollow Road Metville, NY 11747 (516) 752-9700 Major Market: Communications Equipment Manufacturing Target Industries: Hotels; Government; Fortune 100

Head of Marketing: Mike Rosen

NEC TELEPHONE, INC.

Head of Sales: Skip Connolly Head of Engineering: Kanji Suzuki Head of Customer Service: Ralph Russo Geographic Goverage: International Year Established: 1971 Number of Employees: 170

NESCO
107 San Zeno Way
Surnrywiel, CA 94086
(408) 737-2080
Major Market: Communications
Equipment Manufacturing;
Communications Network
Target Industries: Utilities
Target Applications:
Telecommunications
Contacts:
Head of Marketing: Jim Peluso
Head of Customer Service: Nancy
Peluso
Geographic Coverage: International
Year Established: 1975

NESTAR SYSTEMS, INC.
2585 East Bayshore Road
Palo Alto, CA 94303
(415) 493-2223
Major Market Component,
Computer, Peripheral,
Communications Equipment and
Office Equipment Manufacturing;
Coff (Peripherals-Terminals);
Software House; Systems House
(Commercial OEM);
Dealer/Distributor
Target Industries: Financial;
Manufacturing
Comacts
Head of Marketing: Peter Hertan
Head of Marketing: Peter Hertan

Number of Employees: 30

Contacts: Head of Marketing: Peter Hertan Head of Sales: William Coleman Head of Engineering: Leonard J. Shustek Geographic Coverage: International Year Established: 1978 Number of Employees: 100

NETWORK PRODUCTS, INC.
Progress Center
P.O. Box 13239
Research Triengle Park, NC 27709
(919) 549-6210
Major Market: Communications
Equipment Manufacturing
Target Industries: System Houses
Contacts:
Head of Marketing: John H. Rouse
Head of Software: Stephen I.
Schleimer
Geographic Coverage: International
Year Established: 1981
Number of Employees: 25

NETWORK SYSTEM CORP. 7600 Boone Ave. N. Brooklyn Park, MN 55428 (612) 425-2202 Major Market: Software House

Target Industries: Finance;

Manufacturing; Petro/Chemical; Deta Service Target Applications: Computer-To-Computer Network; Remote Service Network; Local-Area Networks Contacts:

Head of Marketing: Mahlon Moore Head of Software: Hal Durrett

Head of Engineering: Gerald Olson Head of Customer Service: Don Leu Geographic Coverage: International Vear Fatablished 1974 Number of Employees: 450

# HEW GENERATION SYSTEMS.

2153 Golf Course Dr. Reston, VA (703) 476-9143 Major Market: Software House Net Sales: \$100.000 - \$500.000 (1982)Geographic Coverage: International Year Established: 1981 Number of Employees: 2

## NIXDORF COMPUTER CORP.

300 Third Ave. Waltham, MA 02154 (617) 890-3600 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing: Software House Target Industries: Banking; Retail; Transportation; Medical Target Applications: Accounting; General Business Head of Marketing: Mike Backler Heart of Sales: Robert Davis Head of Software: James Addlesberger Geographic Coverage: International Year Established: 1952 Number of Employees: 1,800

## NOAKES DATA

COMMUNICATIONS, INC. 3330 Stovall Irving, TX 75061 (214) 986-1151 Major Market: Component, Computer and Communications Equipment Manufacturing; Dealer/ Target Applications: Data Communications; Network Control; Data Collection Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Kenneth Brown Geographic Coverage: National Year Established: 1966 Number of Employees: 30

## HORTHEAST DATACOM, INC.

4 Tower Dr. Wallingford, CT 06492 (203) 265-3455 Major Market: Software House: Systems House (Commercial OEM): Data Services (Service Bureau) Target Industries: Banking: Manufacturing; Thrift Head of Marketing: James W. Blair Head of Customer Service: J. Smith Geographic Coverage: Regional Year Established: 1969

### Number of Employees: 135 **HORTHERN TELECOM, INC.** Cook Electric Division 6201 Oakton St

Morton Grove, IL 60053 (312) 967-6600 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Communications Head of Marketing: W. Viviano Head of Sales: G. Meyer Head of Software: Frank Brennan Geographic Coverage: International Year Established: 1886 Number of Employees: 750

NORTHERN TELECOM, INC. Electronic Office Systems Division Data Park P.O. Box 1222 Minneapolis, MN 55440 (612) 932-8656 Major Market: Computer, Terminal. Peripheral, Communications Equipment and Office Equipment Manufacturing; Software House Target Industries: Manufacturing: Banking; Government; Education Target Applications: Inquiry/Response; Data Entry; Distributed Data: RJE Contacts: Head of Marketing: R. W. Duthie

Head of Sales: S. T. Oppenheime Head of Customer Service: J. Vaughn Geographic Coverage: International

# HORTHERN TELECOM, INC. Integrated Office Systems Division 1001 E. Arapaho Road

Richardson, TX (214) 234-5300 Major Market: Computer, Terminal, Perinheral and Communications Equipment Manufacturing; OEM (Computer Systems) Target industries: Fortune 1000; Government: Institutions Target Applications: Lodging: Hospital; Financial Contacts Head of Marketing: Bob Dyer Head of Sales: Nelson Boyd Head of Software: Bruce Stevens Head of Engineering: Bob Davi Head of Customer Service: Bob

Wilden Geographic Coverage: International Year Established: 1975 Number of Employees: 7,500

### NOVATION, INC. 20409 Prairie St.

Chatsworth, CA 91311 (213) 996-5060 Major Market: Terminal, Peripheral and Communications Equipment Manufacturing; OEM (Peripherals-Terminals): Systems House (Commercial OEM): Dealer/Distributor **Target Applications:** Communications Contacts: Head of Marketing: Jerry Grimson Head of Engineering: Alex Nagy Head of Customer Service: Teddi Cook Geographic Coverage: International

Year Established: 1967

Number of Employees: 125

NOVELL, INC. 1170 N. Industrial Park Dr. Orem IIT 84057 (801) 226-8202 Major Market: Communications Equipment Manufacturing Target Industries: Industry Target Applications: Airline Reservation Contacts Head of Marketing: Reid Clark Head of Engineering: David Owen Geographic Coverage: International

## NU DATA CORP.

Year Established: 1980

Number of Employees: 35

32 Fairview Ave. P.O. Box 125 Little Silver NJ 07739 (201) 842-5757 **Najor Market: Communications Equipment Manufacturing Target Industries: Telecommunications** Head of Engineering: Richard Previte Geographic Coverage: International Year Established: 1972 Number of Employees: 24

# OFFICE EXPRESS, INC.

Top Down Systems Division Suite 236 414 Hungerford Dr Rockville, MD (301) 251-9400 Major Market: Software House Contacts

Head of Sales: Skip Cashwell Geographic Coverage: National Year Established: 1980 Number of Employees: 4

5901-B Peach Tree Dunwoody Road

## OKI ELECTRONICS OF AMERICA, INC. Atlanta, GA 30093

(404) 399-5500 Major Market: Component Computer, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals): Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Industries: Lodging Contacts Head of Marketing: Steve Fields Head of Sales: Dick Fisher Geographic Coverage: International Year Established: 1969

Number of Employees: 325

### OMNIDATA

5717 Corsa Ave. Westlake Village, CA 91362 (213) 991-5810 Major Market: Computer and Office Equipment Manufacturing Target Industries: OA Head of Marketing: George Greenspon Head of Engineering: Raymond Lee Geographic Coverage: National Year Established: 1978 Number of Employees: 100

### OPTELECOM

15940 Luanne Dr. Gaithershum MD 20877 (301) 948-4232 Major Market: Communications Equipment Manufacturing Target Industries: Government; OEM: Industrial Contacts: Head of Marketing: Fred Egglestron Head of Engineering: Jim Coffman Head of Customer Service: Suzie Clark Geographic Coverage: National Year Established: 1972 Number of Employees: 35

# OPTICAL COMMUNICATIONS

950 Norwood Road iver Spring, MD 20904 (301) 924-2800 Major Market: Peripheral. Communications Equipment and Office Equipment Manufacturing; **OEM** (Peripherals-Terminals) Target Industries: Military; Telecommunications. Target Applications: Video; Data/Voice Contacts Head of Marketing: C. Wallach Year Established: 1975 Number of Employees: 9

## ORCHID TECHNOLOGY, INC.

4770 Westinghouse Road Fremont, CA (415) 490-8556 94539 Major Market: Peripheral and Communications Equipment Manufacturing Contacts Head of Marketing: Bob Davi Head of Sales: Bob Gronsky Head of Software: Hao Nguyen Head of Engineering: Dr. Le Bui Head of Customer Service: Chris McGovern Geographic Coverage: International Year Established: 1982 Number of Employees: 32

# ORION SOFTWARE, INC.

Suite 200 400-2 Totten Pond Road Waltham, MA 02154 (617) 890-2223 Major Market: Software House Net Sales: \$1 Million - \$5 Million Contacts Head of Marketing: Jim Waite Head of Software: Wilton Rooks Geographic Coverage: International Year Established: 1977 Number of Employees: 30

PACER SOFTWARE 1227 Pearl St. La Jolla, CA 92037 (619) 454-0565 Major Market: Software House Net Sales: Less than \$100,000 (1982)Geographic Coverage: International Year Established: 1981 Number of Employees: 5

PACESETTER SYSTEMS, INC. uite 132

4141 Blue Lake Circle Dallas TX 75234 (214) 386-0241 lajor Market: Software House Target Industries: Banking Contr Head of Marketing: J. L. Atchley Geographic Coverage: Nation Year Established: 1976 Number of Employees: 13

PACIFIC SOFTWARE MANUFACTURING CO.

10th and Parker Berkeley, CA 94710 (415) 540-5000 Major Market: Software House Target Industries: Micro Target Applications: DBMS; Communications; WP Geographic Coverage: Intel Year Established: 1981 Number of Employees: 20

PANAFAX CORP.

10 Melville Park Road Melville, NY 11747 (516) 420-0055 Major Market: Communications Equipment and Office Equipment Manufacturing Head of Marketing: Dennis Anderson Head of Engineering: Ted Kekke Head of Customer Service: Hiroshi Shimam Year Established: 1977 Number of Employees: 350

PARADYNE CORP. 8550 Ulmerton Road

P.O. Box 2826 Largo, FL 33540 (813) 530-2000 Major Market: Computer, Terminal, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems); OEM (Peripherals-Terminals); Software House; Dealer/Distributor Target Industries: Banking; Engineering: Manufacturing: Retail Target Applications: WP; OA; Data Entry; DBMS Contacts Head of Marketing: Jerry T. Kendall Head of Sales: John Mullane Head of Software: Les Hyde Head of Engineering: Ken Wall Head of Customer Service: John Koehler Geographic Coverage: International Year Established: 1969 Number of Employees: 3,100

# PARTICIPATION SYSTEMS, 50 Cross St.

Winchester, MA 01890 (617) 729-1976 Major Market: Software House Target Industries: Cross Industry Target Applications: Electronic Mail; Computer Conferencing; Bulletin Contacts:

Head of Marketing: Mike Keehan Head of Software: George Reinhart Geographic Coverage: National Year Established: 1970 Number of Employees: 10

PATHWAY DESIGN, INC.

177 Worcester St ley, MA 02181 (617) 237-7722 Major Market: Software House Geographic Coverage: National Year Established: 1983 Number of Employees: 9

PEACHTREE SOFTWARE, INC. 3445 Peachtree Road N.E. Atlanta, GA 30326 (404) 239-3000 Major Market: Software House Target Applications: End User Head of Marketing: Julian Duckett

Geographic Coverage: International Year Established: 1977 Number of Employees: 145

PECA. INC. 592 Winks Lane Bensalem, PA 19020 (215) 245-1550 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems): Dealer/Distributor Target industries: Data

Communication Systems; Cable Target Applications: Communications Networking Net Sales: \$500,000 - \$1 Million (1982)Contacts: Head of Engineering: James Gracie Head of Customer Service: Joanne

Fields Geographic Coverage: International Year Established: 1968 Number of Employees: 55

PENRIL CORP. Data Communications Division

207 Perry Parkway MD 20877

(301) 984-8225 Major Market: Component. Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Computer Systems): OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM) Target Industries: Data Communications: Computer Target Applications: Contacts Head of Marketing: Dave Johnson Head of Engineering: Les Query Geographic Coverage: International Year Established: 1968 Number of Employees: 1,000

PERCOM DATA CORP. 11220 Pagemill Road Dallas, TX 75243

(214) 340-7081 Major Market: Peripheral and Communications Equipment Manufacturing; Software House Head of Marketing: Bob Gerwer Geographic Coverage: International Year Established: 1976 Number of Employees: 150

PERFORINF SYSTEMS, INC. 15530 Rockfield Blvd.

Building C Irvine, CA 92714 (714) 855-3923 Major Market: Computer Manufacturing; Software House; Dealer/Distributor Target Industries: Fortune 500 Contacts Head of Marketing: Rick Diederich Head of Software: Chris Cole Head of Engineering: Gary Story Head of Customer Service: Pam Geographic Coverage: International Year Established: 1979 Number of Employees: 8

PERIPHERAL TECHNOLOGY.

14784 N.E. 95th St. Redmond, WA 98052 (206) 881-6691 Major Market: Component, Terminal and Communications Equipment Manufacturing: Software House Net Sales: \$500,000 - \$1 Million (1982)Contacts Head of Marketing: Richard Head of Engineering: Al Williams Geographic Coverage: International Year Established: 1979 Number of Employees: 35

PERIPHONICS CORP. 4000 Veterans Memorial Highway Bohemia, NY 11716

(516) 467-0500 Major Market: Computer, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Banking; Retail;

Target Applications: Voice Entry Contacts: Head of Marketing: A. D. Fleener Head of Engineering: George Cole Geographic Coverage: International Year Established: 1969

her of Employ es: 235

PERQ SYSTEMS 2600 Liberty St. P.O. Box 2600 Pittsburgh, PA 15230 (412) 621-6250 lajor Market: Computer Manufacturing Target Industries: OEM Target Applications: Personal Workstation Net Sales: \$1 Million - \$5 Million (1981)Contacts: Head of Marketing: Frank Williams Head of Sales: Kell Hickel Head of Software: James Marshall

Head of Engineering: Brian Rosen

Heart of Customer Service: Frank Geographic Coverage: International Year Established: 1974 Number of Employees: 320

PERSONAL MICROCOMPUTERS

475 Filis St Mountain View, CA 94043 (415) 982-0220 Major Market: Computer, Terminal. Peripheral and Communications **Equipment Manufacturing** Target Industries: Distribution; OEM Systems Integration; Government; End I ker Target Applications: Installed Terminals Contacts Head of Sales: Jack Dacker Geographic Coverage: International Year Established: 1980 Number of Employees: 100

PERSYST, INC.

15801 Rockfield Blvd. Irvine, CA 92714 (714) 859-8871 Major Market: Peripheral and Communications Equipment Manufacturing; Software House Contacts Head of Marketing: Ken Cruickshrank Head of Software: Fred Berry Head of Customer Service: Don Etter Year Established: 1981 Number of Employees: 55

PHALO CORP. Optical Systems Division 65 Moreland Road Simi Valley, CA (805) 522-3333 Major Market: Communications Equipment Manufacturing Contacts: Head of Sales: Jim Rodgers Year Established: 1981

PHILIPS ELECTRONIC INSTRUMENTS, INC.

Division of N. American Philips 85 McKee Dr. Mahwah, NJ 07430 (201) 529-3800 Major Markets: Communications **Equipment Manufacturing** Target Applications: Data Communications Contacta Head of Marketing: B. Robert Feingold Head of Sales: Robert C. Joseph Head of Software: Claud Cesard Geographic Coverage: International Year Established: 1934 Number of Employees: 200

PHOENIX DIGITAL CORP. 2315 N. 35th Ave.

Phoenix, AZ 85009 (602) 278-3591 Major Market: Computer, Terminal and Communications Equipment

Manufacturing; OEM (Computer Systems): Process Automation Computers Target Industries: Automotive; Chemical: Food: Rubber **Target Applications:** Data Acquisition; Process Control; Monitoring; Man-Machine Interface Contacts Head of Marketing: Gerald Trussell Head of Software: Doug Hawkins Head of Customer Service: J. Williams Geographic Coverage: International Year Established: 1977

# Number of Employees: 30 PHONE 1, INC.

JAT N. Mullord Boad Rockford, IL 61107 (815) 397-8110 Major Market: Communications Equipment Manufacturing; Software House Target Industries: Fortune 1000; Communications **Target Applications:** Data Communications Net Sales: \$1 Million - \$5 Million (1983)Contacts Head of Marketing: Roy Lane Head of Software: Mark Koening Head of Customer Service: Da Yuccas Geographic Coverage: National Year Established: 1977 Number of Employees: 12

## P.O. Box 1206 Goleta, CA 93116 (805) 685-4641

Major Market: Software House Geographic Coverage: International Year Established: 1976 Number of Employees: 15

### PITHEY BOWES

PICKLES & TROUT

Waiter Wheeler Dr. Stanford, CT 069260700 (293) 356-5000 Major Market: Communications Equipment and Office Equipment Manufacturing; Mailing Equipment Contacts Head of Marketing: Robert Lawrence Head of Sales: George Bradbury Head of Engineering: Fred Zucker Head of Customer Service: Rowlin Fairbaugh Geographic Coverage: International Year Established: 1920 Number of Employees: 20,000

# PLANNING DATA SYSTEMS

Suite 1524 1601 Walnut St. Philadelphia, PA 19103 (215) 665-1551 Major Market: Software House: Systems House (Commercial OEM) **Target Applications: Mapping** Contacts Head of Marketing: Robert Pallone Geographic Coverage: National Year Established: 1979 Number of Employees: 4

### POLYGON SOFTWARE CORP.

363 7th Ave. New York, NY 10001 (212) 563-5858 Major Market: Software House Geographic Coverage: International Year Established: 1983 Number of Employees: 10

### PRAGMATRONICS, INC.

2015 10th St. Boulder, CO 80302 (303) 444-2600 Major Market: Component and Communications Equipment Manufacturing; Data Services (Service Bureau)
Target Industries: Government; R&D; Laboratories: Warehouse Head of Marketing: Walter Plywaski Head of Engineering: Don Boyle Year Established: 1979 Number of Employees: 7

### PRENTICE CORP.

266 Caspian Dr. Sunnvvale, CA 94086 (408) 734-9810 Major Market: Communications Equipment Manufacturing Head of Marketing: James Buttienworth Head of Sales: Perry Lindberg Geographic Coverage: International Year Established: 1969 Number of Employees: 200

### PRIME COMPUTER, INC.

Natick, MA 01760

(617) 655-8000 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing: OEM (Peripherals-Terminals): Software House Head of Marketing: H.F. Enright Head of Sales: W.L. Brubaker Head of Software: Edward J. Head of Engineering: Roland D. Pamp Head of Customer Service: Ian

Geographic Coverage: International Year Established: 1972 Number of Employees: 5,900

# PROCESSING INNOVATIONS, 10471 S. Brookhurst

Anaheim, CA 92804 (714) 535-8161 Major Market: Communications Equipment Manufacturing Target Industries: Wholesa Target Applications: Remote/Direct Data Entry; Voice-Assisted Modem Net Sales: \$100,000 - \$500,000 Geographic Coverage: International Year Established: 1975 Number of Employees: 5

# PROGRAM RESOURCES, INC.

6001 Montrose Road

Suite 405 Rockville, MD 20852 (301) 984-9020 Major Market: Software House Target Industries: Government Geographic Coverage: National Year Established: 1973 Number of Employees: 10

## PROGRESSIVE SYSTEMS.

New York, NY 10004

80 Broad St

(212) 785-9200

Major Market: Communications Equipment Manufacturing: OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: Publishing: Banking; Brokerage Target Applications: Message Switching; Data Communications Net Sales: \$500,000 - \$1 Million (1981) Contact Head of Marketing: Thomas Head of Software: Vinnie Devita Head of Engineering: Bill Weiher Geographic Coverage: International Year Established: 1979

### PROLINK CORP. 5757 Central Ave. Boulder, CO 80301

Number of Employees: 25

(303) 447-2800 Major Market: Computer and Communications Equipment Manufacturing: OEM (Computer Systems) Head of Marketing: Len Julius Head of Sales: William T. Treadwell Head of Software: Suresh C. Bazaj Head of Engineering: Blayne Maring Head of Customer Service: Carol Snell Geographic Coverage: International Year Established: 1980 Number of Employees: 91

### PROTEON ASSOCIATES, INC.

24 Crescent St.

Waltham, MA 02154 (617) 894-1980 Major Market: Communications Equipment Manufacturing Net Sales: \$1 Million - \$5 Million (1981)Conte Head of Engineering: Allen Marshall Geographic Coverage: International Year Established: 1972 Number of Employees: 35

### PROTOCOL COMPUTERS, INC.

Suite 100 6150 Canoga Ave. Woodland Hills, CA 91367 (818) 716-5500 Major Market: Communications Equipment Manufacturing Target Industries: IBM Host Head of Marketing: Addison Woods Head of Sales: Steve Marks

Head of Engineering: Thomas Jefferson Geographic Coverage: International Year Established: 1980 Number of Employees: 91

### PULSECOM

2900 Towerview Road Herdon, VA 22071 (703) 471-2900 Major Market: Communications Equipment Manufacturing; Software House; Systems House (Commercial OEM) Target Industries: Telecommunications; Railroad Contacte Head of Marketing: Michael Vinocur Head of Engineering: James Britt Geographic Coverage: National Year Established: 1963 Number of Employees: 300

### QUADSTAR CORP.

Suite 145 12700 Preston Road Dallas, TX 75230 (214) 980-9601 Major Market: Software House: Systems House (Commercial OEM) Target Industries: Financial: Retail Net Sales: \$1 Million - \$5 Million (1981)Contacts Head of Marketing: Ray Haymes Head of Software: Tom Streff Geographic Coverage: International Year Established: 1976 Number of Employees: 40

### QUALITY SOFTWARE, INC.

60 Lewis St. Newton, MA 02158 (617) 965-2231 Major Market: Software House Target Industries: Telecommunication Target Applications: Telecommunication; Typesetting Net Sales: \$100,000 - \$500,000 (1981)Contacts: Head of Marketing: Diane Seelman Geographic Coverage: National Year Established: 1980 Number of Employees: 3

QUASITRONICS, INC. 211 Vandale Dr. Houston, PA 15342 (412) 745-2663 Major Market: Peripheral and Communications Equipment Manufacturing: OEM (Computer Systems); OEM (Peripherals-Terminals) Target Industries: Manufacturing Target Applications: Digital/Analog Acquisition Contacts: Head of Marketing: Victor Sulkowski Head of Engineering: Lucian J. Spalla Geographic Coverage: International Year Established: 1971 Number of Employees: 50

# RACAL-MILGO, INC.

6250 N.W. 27 Way Fort Lauderdale, FL 33309

(305) 592-8600 Major Market: Terminal and Communications Equipment Manufacturing Contacts: Head of Marketing: Allen Mastendino Head of Sales: Mat Kenny Geographic Coverage: International Year Established: 1955 Number of Employees: 3,500

## RACAL-TELESYSTEMS, INC.

410 N. Michigan Ave. Chicago, IL 60 (312) 329-0700 Major Market: Communications Equipment Manufacturing: Data Services (Service Bureau) Target Industries: Government; Fortune 100 Contacts: Head of Marketing: Duan Siebert Head of Engineering: Dennis Miller Geographic Coverage: Canada Year Established: 1976 Number of Employees: 40

RACAL-VADIC

1525 McCarthy Blvd. Milnitage CA 95035 (408) 744-0810 Major Market: Data Communications Target Industries: End users; OEM Systems Integrators Head of Marketing: Thomas J. McChane Head of Sales: David Peters Geographic Coverage: international Year Established: 1969 Number of Employees: 900

# RACET COMPUTERS, LTD.

Suite 255 1855 W. Katella Orange, CA 92667 (714) 997-4950 Major Market: Software House Contacts: Head of Marketing: Chris Johnston Geographic Coverage: International Year Established: 1978 Number of Employees: 15

RADIAN CORP. P.O. Box 9948

Austin, TX 78766 (512) 454-4797 Major Market: Component and Computer Manufacturing; OEM (Computer Systems); Software House: Dealer/Distributor Target Industries: Energy Head of Marketing: F. Scott Lagrone Head of Sales: Ted Hudson Geographic Coverage: International Year Established: 1968 Number of Employees: 650

### RANYAN CORP.

15239 Springdale St. Huntington Beach, CA 92649 (714) 895-5504 Major Market: Peripheral and Communications Equipment Manufacturing

Net Sales: \$100,000 - \$500,000 (1982) Head of Marketing: Gardner De Geographic Coverage: International Year Established: 1981

RAPICOM, INC.

Number of Employees: 6

7 Kingsbridge Road Fairfield, NJ 07006 (201) 575-6010 Major Market: Communications Equipment Manufacturing; Dealer/Distributor Contente Head of Marketing: Gary Winkler Head of Sales: John Sheehan Head of Engineering: Paul Brobst Geographic Coverage: International Year Established: 1973 Number of Employees: 630

# RAYCOM SYSTEMS, INC.

6395 Gunpark Dr. Boulder, CO 80301 (303) 530-1620 Major Market: Corrimunications Equipment Manufacturing Target Industries: Medical: Scientific; Robotics **Target Applications: Data** Communications Contacts: Head of Marketing: Milan Mraz Head of Engineering: Bill Gibson Geographic Coverage: International Year Established: 1981 Number of Employees: 35

BAYTHEON CO.

Raytheon Data Systems 115 Norwood Park S. Norwood, MA 02062 (617) 762-6700 Major Market: Computer, Terminal. Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Dealer/Distributor Target Industries: Transportation; Banking; Manufacturing; Distribution Target Applications: Data Entry; Inventory; OA Contacts: Head of Marketing: Jon Hooper Head of Software: Joan Jacobs Geographic Coverage: International Year Established: 1969 Number of Employees: 5,000

## RCS (ROZSA COMPUTER

SYSTEMS), INC. 2116 A. Walsh Ave. Santa Clara, CA 95050 (408) 727-7548 Major Market: Software House: Systems House (Commercial OEM); Dealer/Distributor Target Applications: WP; Accounting Net Sales: \$100,000 - \$500,000 (1981) Contacts Head of Marketing: V. Sripathy Head of Marketing: v. oripatity Geographic Coverage: California Year Established: 1978 Number of Employees: 3

REAL-TIME MANAGEMENT, 10 Middle St.

P.O. Box 1100 Bridgeport, CT (203) 367-8654 06601 Major Market: Software House Systems House (Commercial OEM); Data Services (Service Bureau) Target Industries: Distribution; Manufacturing; Footwear; Medical Head of Marketing: Warren Sisson Geographic Coverage: National Year Established: 1971

Number of Employees: 35 REDDING GROUP, INC. 609 Main St.

Ridgefield, CT 06877 (203) 329-8874 Major Market: Software House Target Applications: Business Graphics; Communications Head of Marketing: Lydia Fazio Head of Customer Service: Phil Campbell

Geographic Coverage: Inte Year Established: 1978 Number of Employees: 6

REMM SYSTEMS, INC. Suite 222 S. Michigan Ave. Chicago, IL 60603 (312) 236-7727 Major Market: Software House Systems House (Commercial OEM): Dealer/Distributor Target Industries: Medical; Dental; Insurance; Legal
Target Applications: Accounting; Billing; Graphics Net Sales: Less than \$100,000 (1981) Contac

Head of Marketing: Bill Maddocks Head of Sales: Neil Long Head of Software: Ronald R. Remm Head of Customer Service: Ed Becher Geographic Coverage: National

REMOTE COMPUTING CORP. Pear Systems Corp.

27 Briarbrae Road Stanford, CT 06903 (203) 322-5593 Major Market: Software House Target Industries: Financial Target Applications: Management; Technical Analysis Geographic Coverage: International Year Established: 1966

RENEX CORP.

6901 Old Keene Mill Road Springfield, VA 22150 (703) 451-2200 Major Market: OEM (Peripherals-Terminals) Target Industries: IBM End Users Target Applications: IBM 3270, System/34, System/36 and System/ 38 Users Net Sales: \$1 Million - \$5 Million Contacts

Head of Marketing: O.M. McCall Head of Engineering: Raymond L. Head of Customer Service: Richard Simpson Geographic Coverage: International Year Established: 1975 Number of Employees: 27

RFL INDUSTRIES

P.O. Box 239 Boonton, NJ 07005 (201) 334-3100 Major Market: Communications Equipment Manufacturing Target Industries: Power Utilities Cont Head of Marketing: Bob Figlar Head of Sales: David Jenki Head of Engineering: Barry Kaufman Geographic Coverage: International Year Established: 1922 Number of Employees: 425

ROTI SYSTEMS SOFTWARE 1 Penn Plaza New York, NY 10001 (212) 695-5001 Major Market: Software House: Systems House (Commercial OEM) Target Industries: Manufacturing Net Sales: \$500,000 - \$1 Million (1981) Contacts Head of Software: Ross F. Amann Geographic Coverage: National Year Established: 1971 Number of Employees: 20

RIANDA ELECTRONICS 2535 Via Palma Anaheim, CA 92801

(714) 995-6552 lajor Market: Computer, Peripheral and Communications Equipment Manufacturing Target industries: DG OEM; DEC OEM Net Sales: \$1 Million - \$5 Million (1981) Contacts Head of Marketing: Frank Williams Head of Engineering: Jose Ventura Head of Customer Service: Bill Cantwell, Geographic Coverage: International Year Established: 1977 Number of Employees: 35

RIXON, INC.

2120 Industrial Pkwy. Silver Spring, MD 20904 (301) 622-2121 Major Market: Communications **Equipment Manufacturing** Contacts: Head of Marketing: Robert Head of Sales: Robert Arnold Geographic Coverage: International Year Established: 1953 Number of Employees: 640

ROCKWELL INTERNATIONAL

Semiconductor Products Division 4311 Jamboree Road P.O. Box C

Newport Beach, CA 92660 (800) 954-9099 Mejor Market: Communications Equipment Manufacturing Centactia: Head of Marketing: D.W. Williams Head of Sales: George Urbani Head of Engineering: W.F. Krolikowski

# ROCKWELL INTERNATIONAL

Switching Systems Division
1431 Opus Place
P.O. Box 1458
Downers Grove, IL 60515
(312) 960-000
Major Markett: Communications
Equipment Marufacturing
Centacts:
Head of Marketing: Charles Young
Geographic Coverage: International
Year Established: 1979
Number of Employees: 1,000

ROLLE CORP.
4900 Old fronside Dr.
Santa Clara, CA 95050
(408) 988-2900
Major Marketh: Computer and
Communications Equipment
Manufacturing
Tanget Applications: Voice/Data
Communications Net
Communications Net
Communications Net
Communications Net
Geographic Coverage: Inchard Moley
Head of Marketing: Richard Moley
Head of Sales: Anthony Carolio
Geographic Coverage: International
Year Established: 1908
Number of Employees: 7,200

ROTELCOM DATA, INC.
930 Fairport Industrial Park
Fairport, NY 14450
(716) 381-3090
Major Market: Software House;
Systems House (Commercial OEM)
Containtie
Head of Software: Joseph Thuroff
Geographic Coverage: International
Year Establishect. 1979
Number of Employees: 60

### RTCS (REAL-TIME COMPUTER SCIENCE) CORP.

P.O. Box 3000-886
Camarillo, CA 93010
(805) 482-0333
Major Market: Software House;
Systems House (Commercial OEM);
Daslar/Distributor
Target Applications: Real-Time
System
Met Sales: \$1 Million - \$5 Million
(1982)
Contracts:
Head of Marketing: Art Baker
Head of Software: Art Baker III
Geographic Coverage: International
Yeas Established: 1978
Number of Employees: 12

RUF CORP. 1533 E. Spruce Olathe, KS. 66061 (913) 782-3544 Major Merket: Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor
Net Sales: \$1 Million - \$5 Million
(1982)
Centacta:
Head of Marketing: Forrest E.
Weddle
Head of Software: Randy Seager
Head of Software: Randy Seager
Head of Engineering: Keith
Constance
Geographic Coverage: International
Year Established: 1976
Number of Employees: 25

# SANYO BUSINESS SYSTEMS

CORP.
51 Joseph St.
Moonachie, NJ. 07074
(201) 440-9300
Major Market: Computer, Terminal,
Peripheral and Office Equipment
Manufacturing; CEM (Perspherals-Terminals); Software House
Contacta:
Head of Marketing: N.Yamashita
Head of Sales: Arthur Shebar

Geographic Coverage: International SCHNEIDER INSTRUMENT CO. 8115 Camargo Road Cincinnati, OH 45243 (513) 561-6803

Head of Customer Service: Mike

Zajak

Major Market: Component and Communications Equipment Manufacturing; OEM (Computer Systems) Net Sales: \$100,000 - \$500,000 (1981)

Contacts: Head of Marketing: Mark Schneider Head of Software: G. L. Schneider Geographic Coverage: International Year Established: 1966 Number of Employees: 12

SCIENTIFIC ATLANTA, INC. One Technology Parkway P.O. Box 105600

Atlenta, GA 30348 (404) 449-2000 Major Market: Communications Equipment Manufacturing; Software House Target Industries: Cable; Broadcasting; Business Telescommunications: Contacta: Head of Marketing: Del Bothof Head of Engineering: Dr. Guy Beakley Geographic Coverage: International Year Established: 1952 Number of Employees: 5,000

SCIENTIFIC DATA SYSTEMS, INC.

344 Main St. Venice, CA 90291 (213) 390-8673 Major Market: Computer and Communications Equipment Manufacturing; Software House Target Industries: Legal; Medical; Accounting; Trash Collection Target Applications: WP; Legal Time and Billing; Temporary Help Centacts: Head of Software: William Weldon

Head of Engineering: Jack M. Mitchell Geographic Coverage: National Year Established: 1977 Number of Employees: 50

SCIENTIFIC RADIATION

1201 San Antonio Road Mountain View, CA 94043 (415) 965-0911 Major Market: Communications Equipment Manufacturing Contacts: Head of Sales: James A. Lazzara Geographic Coverage: National Year Established: 1975

Number of Employees: 50

SCITEC CORP.
850 Aquidneck Ave.
Middletown, RI 02840
(401) 849-4353

Major Merket: Communications Equipment Manufacturing Terget Industries: Manufacturing; Banking; Time-Sharing; Airline Net Sales: \$1 Million - \$5 Million (1982) Contacts: Head of Marketing: Gerald Olson Head of Marketing: Gerald Olson

Geographic Coverage: International Year Established: 1978 Number of Employees: 90 SEISCORP, INC.

5311 S. 122 E. Ave.
P.O. Box 1590
Tulsa, OK. 74145
(918) 627-3330
Mejor Market: Communications
Equipment Manufacturing
Target Industries: Telephone;
Petrochemical; Data Collection
Contacts:
Head of Marketing: Edward
Crossland
Geographic Coverage: International
Number of Employees: 350

SENSIBLE SOFTWARE, INC. 6619 Perham Dr.

West Bioomfield, MI 48033
(313) 399-8877
Major Market: Software House
Target Industries: Apple Users
Net Sales: \$500,000 - \$1 Million
(1982)
Head of Marketing: Tracy Shelly
Head of Software: Roger Tuttleman
Head of Engineering: Charles Hartley
Head of Customer Service: Joe
Emery
Geographic Coverage: International
Year Established: 1978
Number of Employees: 10

SGS SEMICONDUCTORS,

1000 E. Bell Road
Phoenix, AZ 85022
(602) 867-6100
Meljor Merket: Component,
Computer, Communications
Equipment and Office Equipment
Merufacturing; OEM (Peripherals-Terminals); Software House;
Systems House (Commercial OEM) Target Industries: Communications; Industrial; Business; OA Contactas: Head of Marketing: Dave Hage Head of Software: Bob Lindstrom Head of Engineering: Jean Claude Monney Head of Customer Service: Rubin Sonnino Geographic Coverage: International Year Established: 1957 Number of Employees: 600

SHAFFSTALL CORP.
7901 E. 88th St.
Indianapolis, IN 46256
(317) 942-2077
Major Market: Communications
Equipment Manufacturing
Target Industries: Data
Communications; Printing
Contactis:
Head of Marketing: Tim Shaffstall
Head of Sales: Anthony Shaffstall
Geographic Coverage: International
Year Established: 1973
Number of Employees: 40

BHERWOOD DIGITAL
ELECTRONICS
2252 S. 3900 W. B4119
(801) 972-3453
Major Market: Terminal, Peripheral
and Communications Equipment
Manufacturing
Target Industries: IBM System/34,
System/38 and Compatibles
Net Sales: \$1 Million - \$5 Million
(1983)
Contacts:
Head of Marketing: John T. Lever Jr.
Geographic Coverage: International
Number of Employees: 11

SIDEREAL CORP.
9600 S. W. Barnes Road
Portland, OR 97225
(503) 297-5531
Mejor Market: Terminal and
Communications Equipment
Manufacturing
Lead of Marketing: James Miller
Head of Customer Service: Robert
Blake
Geographic Coverage: National
Year Established: 1971
Number of Employees: 160

SIEMENS COMMUNICATIONS SYSTEMS Office Systems Group

a Ya Tablia
Office Systems Group
240 E. Palais Road
Ansheim, CA. 92805
(714) 991-9700
Major Market: Terminal, Peripheral
and Office Equipment Manufacturing
Tariget Industries: Communications
Target Applications: Office
Communication
Contactas:
Head of Marketing: Mike Kurz
Geographic Coverage: National
Year Established: 1982
Number of Employees: 750

SIERRA RESEARCH CORP. 455 Cayuga Dr. P.O. Box 222
Buffalo, NY 14225
(710) 831-820
Major Market: Terminal, Peripheral
and Communications Equipment
Manufacturing
Target industries: Manufacturing
Target Applications: Data Entry
Contacts:
Head of Marketing: Roy H. Hobson
Head of Software: Edwin L. Hill
Head of Engineering: Mike Rupp
Head of Customer Service: Marilyn
Euler
Geographic Coverage: International
Year Established: 1969
Market of Employees: 100

SIMCON, INSC.
1945 Gallows Road
Vlarne, VA 22180
(703) 448-8600
Major Market Communications
Equipment Manufacturing; OEM
(Computer Systems); OEM
(Peripheralis-Terminals); Software
House; Systems House (Commercial
OEM); Data Sarvices (Services
Bureau); Dealer/Distributor
Tanget Industries: Law
Enforcement; Insurance; Mass
Transit; Professional Services
Tanget Applications: Dispatching
Net Sales: \$1 Million - \$5 Million
(1981)
Contacts:

Head of Sales: Larry Claussen Head of Software: Lew Henneke Head of Customer Service: Thomas Castor Geographic Coverage: National Year Extablished: 1971 Number of Employees: 75

SMART, INC.

26 Cricket Lane
Wilton, CT 06897
(203) 782-3279
(203) 782-3279
Major Market: Software House;
Data Services (Service Bureau)
Target Industries: Retail
Target Applications: POS
Net Sales: \$1 Million . \$5 Million
(1981)
Contracta:
Head of Sales: Cletus Smith
Head of Software: Emile Collins
Geographic Coverage: International
Year Established: 1969
Number of Employees: 37

SMITH EDUCATIONAL
ENGINEERING SERVICES,
INC.
P.O. Box 244
Arington Heights, IL 60006
(312) 394-3513
Major Markets Software House
Contacts:
Head of Marketing: George Tucker
Geographic Coverage: National
Year Established: 1979
Number of Employees: 25

SOFTWARE &
COMMUNICATION
CONCEPTS, INC.
Suite 350

11211 Katy Freeway Houston, TX 77079 (713) 464-913 Major Market Communications Equipment Menufacturing: Software House: Systems House (Commercial OEM) Net Saless: \$500,000 - \$1 Million (1991)

Head of Engineering: David Demi Geographic Coverage: National Year Established: 1974 Number of Employees: 12

SOFTWARE AG OF NORTH
AMERICA, INC.
11800 Sunrise Valley Dr.
Reston, VA 22091
(703) 860-5050
Major Market: Software House
Target Industries: DBMS; On-Line
Application Development Languages;
TP Monitor
Net Sales: \$25 Million - \$100 Million
(1983)
Head of Marketing: Donald M.
France
Geographic Coverage: International
Year Established: 1973
Number of Employees: 250

SOFTWARE CLEARING HOUSE 771 Neeb Road P.O. Box 38206 Cincinnati, OH 45238 (513) 451-6742 Major Market: Software House Target Industries: NCR users Net Sales: \$1 Million - \$5 Million (1981) Contacts:

Contacta:
Contacta:
Head of Marketing: Torn Ivers
Head of Sales: Jack Ivers
Head of Customer Service: William
Ivers
Geographic Coverage: International
Year Established: 1979
Number of Employees: 30

SOFTWARE DEVELOPMENT & MAINTENANCE, INC.

134 Spring Ave.
P.O. Box 668
Fuguay-Varina, NC 27526
(319) 552-5662
Mejor Market: OEM (Computer Systems); OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM) Target Industries: Banking; Manufacturing
Target Applications: ATM; Electronic Mail Transfer, POS; EFT Net Sales: \$1 Million (1981)
Contacts:
Head of Marketing: David W. Leham

Head of Software: P. E. Truelove Head of Customer Service: Rick Carpenter Geographic Coverage: International Year Established: 1980 Number of Employees: 13

SOFTWARE DEVELOPMENT CORP. Suite 2H 270 Arnity Road
Woodbridge, CT 06525
(203) 387-0500
Major Market: Software House
Target Industries: Retail Pharmacy;
Medical: Legal: Financial
Target Applications: Remote Data
Access; Losn Accounting
Contacts:
Head of Software: Terry Gilbeau
Geographic Coverage: international
Year Established: 1976
Number of Employees: 9

SOFTWARE DYNAMICS
Suite G
2111 W. Crescent
Anaheim, CA 92801
(714) 635-4760
Major Market: OEM (Peripherals-Terminals); Software House
Cortacta:
Head of Engineering: Ira C. Baxter
Geographic Coverage: International
Year Established: 1977
Number of Employees: 5

SOFTWARE MANAGEMENT SYSTEMS, INC. 84 inverness Circle E. Englewood, CO 80112 (303) 741-3179 Major Martiett Software House; Systems House (Commercial CEM) Target Indiastries: Construction; Engineering: General Industry Target Applicatione: Accounting: Financial and Project Management Net Salies: \$1 Million - \$5 Million (1981) Head of Marketing: Bill Beck Head of Marketing: Bill Beck Head of Customer Service: Robert Otten

Geographic Coverage: National Year Established: 1978 Mumber of Employees: 30 SOFTWARE RESULTS CORP. 2887 Silver Dr. Columbus, OH (43211 (614) 421-2094 Major Market Communications Equipment Manufacturing; OEM (Computer Systems) Target Applications: Data Communication Net Sales: \$500,000 - \$1 Million (1981)

Contacts: Head of Marketing: E. J. Sadlowski Head of Software: S. K. Wilson Head of Engineering: M. J. Himes

Remember to mention the Computerworld Buyer's Guide when contacting vendors.



Geographic Coverage: International Year Established: 1975 Number of Employees: 25

### THE SOFTWARE STORE

706 Chippewa Square Marquette, Mi (906) 228-7622 Major Market: Software House Target Industries: CP/M Computer **Target Applications: POS** Con Head of Marketing: Terry L. Horton Geographic Coverage: International Year Established: 1977 Number of Employees: 5

### SOFTWARE SYSTEMS, INC.

P.O. Box 1766 Jefferson City, MO 65101 (314) 635-5852 Major Market: Software House Net Sales: \$100,000 - \$500,000 (1981) Cont Head of Marketing: Ewin Barnett Geographic Coverage: International Year Established: 1980 Number of Employees: 3

# SOFTWORKS, INC. 7801 Old Branch Ave Clinton, MD 20735

(301) 868-4221 njor Market: Software House Net Sales: \$500,000 - \$1 Million (1982) Contacts Head of Marketing: Donald Wood Head of Software: Robert Fitzyerald Head of Engineering: Claude Kinsey Geographic Coverage: International Year Established: 1977 Number of Employees: 12

### SOLID STATE SYSTEMS, INC.

1990 Delk Industrial Blvd. Marietta, GA 30067 (404) 952-9401 Major Market: Communications Equipment Manufacturing Target Industries: Hospitals; School Systems; Manufacturing **Target Applications: Energy** Management Head of Marketing: Jason Schloss Head of Engineering: Joseph Mehassey Geographic Coverage: National Year Established: 1974 Number of Employees: 100

### SONEX, INC.

931-939 E. Lycoming St. Philadelphia, PA 19124 (215) 533-4900 Major Market: Communications Equipment Manufacturing Target Industries: Industrial; Military Net Sales: \$1 Million - \$5 Million (1981) Head of Sales/Marketing: Don Buccini Head of Engineering: James Benson Geographic Coverage: International

Year Established: 1959 Number of Employees: 28

### SOUTHERN COMPUTER SYSTEMS, INC.

2304 12th Ave. N.

P.O. Box 55473 Birmingham, AL 35255 (205) 933-1659 Major Market: Computer Manufacturing; OEM (Computer Systems); Software House; Data Services (Service Bureau); Dealer/Distributor Target Applications: Data Entry Net Sales: \$500,000 - \$1 Million (1981)Head of Marketing: Paul Scalin Head of Software: Mark Sumner Geographic Coverage: International Year Established: 1979 Number of Employees: 7

### SOUTHWESTERN DATA SYSTEMS, INC.

10761 Woodside Ave. Santee, CA 92071 (619) 562-3670 Major Market: Software House Target Applications: General Business; Educational; Utilities; Communications Net Sales: \$500,000 - \$1 Million (1981)Geographic Coverage: International Year Established: 1978 Number of Employees: 11

# SPARTACUS COMPUTERS,

5 N. Park Dr. Bedford, MA 01730 (617) 275-4220 lajor Market: OEM (Peripherals-Terminals); Software House Contacts Head of Marketing: Paul Insfield Head of Sales: John Roderick Head of Software: Michael Cassily Head of Engineering: Michael Oye Geographic Coverage: International Year Established: 1981 Number of Employees: 30

# SPERRY CORP.

Township Line & Union Meeting P.O. Box 500 Blue Bell, PA 19424 (215) 542-4011 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing; OEM (Computer Systems); Software House Target Industries: Manufacturing; Public Sector; Distribution; Airline Net Sales: \$100,000 - \$500,000 Cont Head of Marketing: Joseph Clasullo Geographic Coverage: International Year Established: 1962 mber of Employees: 48,000

# STANDARD DATA CORP

1540 Broadway

New York, NY 10036 (212) 586-3100 Major Market: Communications Equipment Manufacturing; Software House: Data Services (Service Bureau)

Target Industries: Pension and Welfare Funds; Associations; Unions Net Sales; \$1 Million - \$5 Million (1981)

Geographic Coverage: New York Year Established: 1959 Number of Employees: 93

### STARNET DATA SYSTEMS

1331 W. 7th Ave Denver, CO 80223 (303) 935-3566 Major Market: Communications Equipment Manufacturing Year Established: 1983 Number of Employees: 4

### START SYSTEMS Suite 610

1120 Ave. of the Americas New York, NY 10036 (212) 398-1717 Major Market: Software House Systems House (Commercial OEM) Target Industries: Retail; Nonprofit; Banking; Insurance les: \$1 Million - \$5 Million (1981)Conta Head of Software: Ira Dodelman Geographic Coverage: International Year Established: 1976 Number of Employees: 20

# STEARN COMPUTER 10901 Bren Road E.

P.O. Box 9384 Minneapolis, MN 55440 (612) 936-2000 Major Market: Computer and Communications Equipment Manufacturing ies: Fortune 1000; Target industr Small Business Target Applications: OA Cont Head of Marketing: Bob Gallagher Head of Engineering: John Schinas Head of Customer Service: Kathy Forde Geographic Coverage: International Year Established: 1982 Number of Employees: 110

### STRATUS COMPUTER, INC.

Natick MA 01760 (617) 653-1466 Major Market: Computer and Communications Equipment Manufacturing; OEM (Peripherals-Terminals); Software House Target Applications: Transaction Processing; Networking Contacts: Head of Marketing: John Morgridge Head of Sales: Jim Austin Head of Software: Bob Freiburghouse Head of Engineering: G. Hendrie Head of Customer Service: John

Geographic Coverage: International Year Established: 1980 Number of Employees: 250

### **SUMMA FOUR**

2456 Brown Ave. Manchester, NH 03103 (603) 625-4050 Major Market: Communications **Equipment Manufacturing** Target Industries: Hospitality; Commercial Business Target Applications: Telephone Management Conta Head of Marketing: John A. Beton Head of Sales: Nathan R. Cyr Head of Software: Helen Summers Head of Engineering: John T. Boatwright Geographic Coverage: International Year Established: 1976

### SUPERSOFT, INC. P.O. Box 1628

Number of Employees: 100

Champaign, IL (217) 359-2112 Major Market: Software House Net Sales: \$500.000 - \$1 Million (1981) Head of Marketing: Stephen Hagler Head of Sales: Rita Aherin Head of Software: Richard Balocca Head of Engineering: Mike Pagels Head of Customer Service: Mile McIntosh Geographic Coverage: International Year Established: 1978 Number of Employees: 25

## SYNALTA SYSTEMS

3114 Broadway Astoria, NY 11106 (212) 728-6700 Major Market: Computer and Communications Equipment Manufacturing; Software House Target Industries: Data Communications; OEM; Single-Card Computer: Customized Manufacturers Target Applications: Data Communications Conversion Head of Marketing: Gina Mentoza Head of Engineering: Frank Colombos Year Established: 1979 Number of Employees: 17

SYNTREX, INC. 246 Industrial Way W. Eatontown, NJ 07724 (201) 542-1500 Major Market: Communications Equipment and Office Equipment Manufacturing; Software House Target Industries: Legal; Manufacturing Target Applications: Storage; Text Processing; Retrieval Contacts: Head of Marketing: Lou Turkaly Head of Sales: Barry Ross Head of Software: Phil Sheurin Head of Engineering: Joe Jones Head of Customer Service: Ed Smith Geographic Coverage: International Year Established: 1979 Number of Employees: 450

SYSCOM, INC.

470-B Lakeside Dr. Sunnyrale, CA 94086 (408) 736-7320 Major Market Communications Equipment Manufacturing Terget Applications: Data Communications Contects: Head of Marketing: Para Suramen Geographic Coverage: California Year Established: 1976 Number of Employees: 8

SYSTAR CORP.
Suite 208
1762 Technology Dr.
San Jose, CA 95110
(408) 280-7086
Major Market: Communications
Equipment Manufacturing; CEM
(Computer Systems): Software
House; Systems House (Commercial
CEM): Dealer/Distributor
Target Induserine: General Business
Target Applications: Protocol
Conversion: Electronic Mali; WP
Net Sales: 5500,000 - 31 Million
(1981)
Head of Marketing: Dorian Filippini
Head of Software: Steven Jackowski
Geographic Coverage: International
Year Established: 1977

BYSTEM & SOFTWARE, INC.
Sulto 500
1319 Butterfield Road
Downers Grove, IL. 60515
(312) 960-1181
Major Marinet: Software House;
Systems House;
Systems House;
Control
Target Applications: Inclustrial
Control
Net Salese \$500,000 - \$1 Million
(1981)
Contacts
Head of Marketing: Jack Pon
Head of Engineering: John Fu
Head of Customer Service: Nancy
Cummins
Geographic Coverage: National
Year Established: 1977
Number of Employees: 10

per of Employees: 24

SYSTEMS RESOURCES CORP.
121 W. Eirnwood Place
Minneapolis, MM 55419
(612) 631-0125
(612) 631-0125
Major Market: Software House;
Systems House (Commercial OEM)
Target Industries: General Business
Target Applications: DBMS
Net Sales: \$1 Million - \$5 Million
(1981)
Contlactis:
Head of Marketing: Charles Lanbka
Geographic Coverage: International
Year Established: 1975
Namber of Employees: 45

THE SYSTEMS CENTER 2988 Campus Dr. San Mateo, CA 94403 (415) 345-0611
Major Market: Software House;
Systems House (Commercial OEM)
Target Applications: IBM SNA Data
Communications; IDP
Net Saless: \$100,000 - \$500,000
(1982)
Contacts:
Head of Marketing: P. G. Schott
Head of Software: R. J. Ordahl
Head of Engineering: W. N. Creech
Head of Customer Service: R. A.
Chang
Year Established: 1981
Number of Employees: 45

THE SYSTEMS CENTER, IMC.
1320 Greenway Dr.
Irving, TX 75062
(15) 345-0611
Major Market: Software House;
Systems House (Commercial OEM)
Contacts:
Head of Marketing: Peter Shott
Head of Software: Norm Creech
Geographic Coverage: National
Year Established: 1981
Number of Employees: 18

SYSTEMS STRATEGHES, IMC.
225 W. 34th St.
New York, NY 10001
(212) 279-6400
Major Market: Software House;
Systems House (Commercial OEM)
Target Industries: Banking:
Broksrage; Terminal Manufacturing
Broksrage; Terminal Manufacturing
Het Sales: \$1 Million - \$5 Million
(1981)
Contacta:
Head of Sales: Raiph Cafero
Geographic Coverage: National
Year Established: 1978
Number of Employees: \$2

SYTEK, INC.
1225 Chartestor Road
Mountain View, CA 94043
(415) 986-7300
Major Market Component,
Computer, Communications
Equipment and Office Equipment
Manufacturing; OEM (Computer
Systems); Software House;
Dealer/Distributor
Target Industries: Government;
Universities; Fortune 100, Hospitals
Target Applications: DDP;
Networks
Contacts:
Head of Marketing: George Klaus

Contacta: Head of Marketing: George Klaus Head of Sales: Rhonda St. John Head of Software: Kennety Bibs Head of Engineering: 2vl Alon Geographic Coverage: International Year Established: 1979 Number of Employees: 250

TAFT CONSULTING, INC.
161 William St.
New York, NY 10038
(212) 964-3636
Major Market: Software House;
Systems House (Commercial CEM)
Target Industries: Government;
Medical; Wholesale Distributors;
Communications
Target Applications: Electronic Mail;
Target Applications: Electronic Mail;

Text Retrieval; WP; Message Switching Net Sales: \$1 Million - \$5 Million (1981) Contacts: Head of Marketing: Russ Laubenheimer Geographic Coverage: International Year Established: 1971 Number of Employees: 10

TAMDERIA COMPUTERS, SHC. 19333 Valco Pivey.
Cupertino, CA 95014
(408) 725-9000
Major Market: Computer, Terminal and Communications Equipment Manufacturing; Software House Contacts:
Head of Marketing: David Mackie Head of Sales: Jerry Peterson Head of Engineering: Larry Laurich Head of Customer Service: Jerry Everett
Geographic Coverage: International Year Established: 1974
Number of Employees: 4,400

TAMDY CORP.

Radio Shack

1500 One Tandy Center
Fort Worth, TX 76102
(617) 380-3011
Major Market: Computer, Terminal,
Peripheral and Communications
Equipment Manufacturing; OEM
(Computer Systems); Software
House; Dealer/(Distributor
Target Industries: Logal; Medical;
Real Estate; General Business
Contacts:
Head of Marketing: Ron Stagell
Head of Engineering; John Patterson
Geographic Geverage; International
Year Established: 1921
Number of Employees: 30,000

TAU-TROU, INC.
27 Industrial Ave.
Chelmsford, MA 01824
(617) 256-9013
Major Market: Communications
Equipment Manufacturing
Target industries: Fortune 1000;
Tolecommunications
Contacts:
Head of Marketing: William Rollins
Head of Engineering: Philip Gendron
Year Established: 1968
Number of Employees: 220

P.O. Box T
Wilton, CT 08897
(203) 834-8227
Major Market: Component and
Communications Equipment
Manufacturing
Terget Industries: Banking;
Insurance; Transportation;
Manufacturing
Terget Applications: Data
Communications; Switching
Contects:
Head of Marketing: Walter Johnson
Head of Sales: Thomas J. Infantino
Head of Software: Ray Mazurek
Head of Engineering: Keith Weits

T-BAR, INC.

141 Danbury Road

Head of Customer Service: Joseph Swiatek Geographic Coverage: International Year Established: 1959 Number of Employees: 560

TECHLAND SYSTEMS, IMC.
25 Waterside Plaza
New York, NY 10010
(212) 884-7788
Major Markiet: Communications
Equipment Manufacturing; Software
House
Target Applications:
Communications
Net Sales: \$1 Million - \$5 Million
(1983)
Contacts:
Head of Marketing: Richard Clowes
Geographic Coverage: International
Year Established: 1982
Number of Employees: 20

TECHNICO, INC.
2901 Druid Park Dr.
Technology Center
Baltimore, MD 21215
(301) 869-1400
Mejor Merket: Computer
Manufacturing; Software House
Target Industrial
Business; Industrial
Target Applications: Training; Office
Net Sales: \$1 Million - \$5 Million
(1981)
Geographic Coverage: National
Year Established: 1976
Number of Employees: 10

TECHTRAM INDUSTRIES, INC.

200 Commerce Dr

TECMAR, INC.

Rochester, NY 14823
(716) 334-9640
Major Market: Peripheral and
Communications Equipment
Manufacturities: Banking;
Telescommunications; Research;
Military
Terget Applications: Data Storage;
Message Recording
Mist Sales: 31 Million - 35 Million
(1982)
Net Sales: 31 Million - 35 Million
(1982)
Head of Marketing: Frank Atti
Head of Sales: Ray Smith
Head of Engineering: Robert Wagner
Geographic Coverage: International
Year Established: 1998
Number of Employees: 120

8225 Cochran Road
Cleveland, OH 44139
(216) 349-0600
Major Market Computer, Peripheral
and Communications Equipment
Manufacturing
Target Industries: Personal
Computing: Scientific: Manufacturing
Target Applications: Industrial
Control
Contacts:
Head of Marketing: Carolyn Alpert
Head of Sales: John Brandon
Geographic Coverages: International
Year Established: 1974
Number of Employees: 350

TEK-COM, INC.

Suite C103 1887 O'Toole Ave San Jose, CA 95131 (408) 263-7400 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: Joseph Gaynor Head of Sales: Susan Stillwell Head of Customer Service: Becky Hentington Geographic Coverage: International Year Established: 1983 Number of Employees: 10

TEKELEC, INC.

2932 Wilshire Blvd. Santa Monica, CA 90403 (213) 829-7305 Major Market: Communications Equipment Manufacturing; Software House Target Industries: Data Communication Engineers; Data Network Users Target Applications: X.25 Packet Switching: SNA/SDLC Contacte Head of Marketing: Michael Lee Head of Sales: Robert Hess Head of Software: Adrian Warren Head of Engineering: Stephan Heart of Customer Service: Anders Highlin Geographic Coverage: International Year Established: 1971 Number of Employees: 19

# TEKNEKRON INFO SWITCH

1784 Firman Dr. Richardson, TX 75081 (214) 644-0570 Head of Sales/Marketing: Bill Sequin Head of Engineering: Jene Swisston Year Established: 1983

# TEXTRONIX, INC.

P.O. Box 500 verton, OR 97077 (503) 627-7111 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing; Software House Target Industries: Engineering; Manufacturing; Television Target Applications: Test/ Measurement; Graphics Geographic Coverage: International Year Established: 1946 Number of Employees: 22,000

### TELAUTOGRAPH CORP.

8700 Bellanca Ave. Los Angeles, CA 90045 (213) 641-3690 Major Market: Dealer/Distributor Target Industries: Medical; Legal; Oil; Manufacturing Contacts: Head of Marketing: Frank May Head of Engineering: Plank May Head of Engineering: Raghu Rai Geographic Coverage: National Year Established: 1889 Number of Employees: 1,888

TELCO RESEARCH CORP.

1818 Division St. Nashville, TN 37203 (615) 383-2251 Major Market: Software House Target Industries: Banking; Manufacturing; Insurance; Brokerage Target Applications: Telecommunications: Textbooks: Optimization; Accounting Head of Marketing: Jacqueline Shrago Head of Sales: Steve Waterman Head of Software/Engineering: Ann Caldwell Head of Customer Service: Harry

TELE/RESOURCES

Geographic Coverage: National Year Established: 1975 Number of Employees: 48

Williams

Northway 10 Executive Park Ushers Road Ballston, NY (518) 877-8571 Rejor Market: Component and Communications Equipment Manufacturing Target Industries: Small- to Medium-Size Businesse Target Applications: Offices; Legal Firms Conts Head of Marketing/Sales: Gene Daly Head of Software: Peter Hayes Head of Engineering: Don Welch Year Established: 1969 ber of Employees: 100

# TELEBYTE TECHHOLOGIES. Remark Datacom Division

4 Sycamore Dr.

Woodbury NY 11797 (516) 367-3806 Major Market: Communications **Equipment Manufacturing** Target Applications: Data Communications Net Sales: \$100,000 - \$500,000 (1982)Contr Head of Sales/Marketing: Blossom Geographic Coverage: International Year Established: 1978 Number of Employees: 10

TELECOM TECHNICI COIES

3072 E. G St. Ontario, CA 91764 (800) 245-9816 Major Market: Communications **Equipment Manufacturing** Target Industries: Airline; Banking; Insurance; Telemarketing Terget Applications: Reservations; Catalogue Sales; Ticketing; Customer Service Head of Marketing: Gwen Blakkan Head of Sales: Paul Wakefield Head of Engineering: John Locke Head of Customer Service: Russ Hage Year Established: 1982

Number of Employees: 90

TELEFACE CORP.

11 Rivington St. New York, NY 10002 (212) 477-6802 Major Market: Communications Equipment Manufacturing Target Industries: General and International Business Target Applications: Communications Head of Marketing: Ron Mullins Year Established: 1980 Number of Employees: 10

TELEPHONE SOFTWARE CONNECTION, INC.

P.O. Box 6548 Torrance, CA 90504 (213) 516-9430 olor Merket: Software House: Data Services (Service Bureau) Target Applications: Communications Geographic Coverage: International Year Established: 1979

TELEPROCESSING PRODUCTS, INC.

4565 E. Industrial St. **Building 7K** Simi Valley, CA 93063 (805) 522-8149 Major Market: Communications Equipment Manufacturing Contacts Head of Marketing: Richard Latch Geographic Coverage: International Year Established: 1978 Number of Employees: 100

## TELEVIDEO SYSTEMS, INC.

1170 Morse Ave Sunnyvale, CA 94086 (408) 745-7760 Major Market: Computer and Terminal Manufacturing
Target Industries: Small Business: Home/Hobby Head of Marketing: R. DuBridge Head of Sales: Mark Siegal Geographic Coverage: International Year Established: 1977 mber of Employees: 525

TELLABS, INC.

4951 Indiana Ave Lisle, IL 60532 (312) 969-8800 Major Market: Communications Equipment Manufacturing Head of Sales: Chris Cooney Head of Engineering: Peter Fuss Geographic Coverage: International Year Established: 1975 Number of Employees: 1,000

TELMAC, INC. 770 Pivet Court Sunnyvale, CA 94086 (408) 737-1534 Major Market: Communications Equipment Manufacturing Target Industries: General Industry; **Target Applications: Data** Communications Contacte Head of Marketing: Kenneth Conroy Head of Engineering: Roy Mason Year Established: 1881 Number of Employees: 5

10801-120th N.E. P.O. Box 657 Kirkland, WA 98033 (206) 827-9626 Major Market: Communications Equipment Manufacturing Target Applications: Data Communications; Local-Area Networks Head of Sales: Dale E. Johnson Head of Software: David Eitelbach Head of Engineering: Floyd Allen Head of Customer Service: Walt Riebe Geographic Coverage: International Year Established: 1968 Number of Employees: 400

TERMINAL DATA CORP. 11878 Coakley Circle Rockville, MD 20852 (301) 881-7655 Major Market: Peripheral. Communications Equipment and Office Equipment Manufacturing; Dealer/Distributor
Target Industries: Communications;
Government; Aerospace
Target Applications: Remote munication; Applied Analysis Contacts: Head of Marketing: Mark Teitelbaum Geographic Coverage: National Year Established: 1970 Number of Employees: 10

TEXAS INSTRUMENTS, INC.

Data Systems Group 12501 Research Blvd. P.O. Box 2909 Austin, TX 78769 (512) 250-7111 Major Market: Component, Computer, Terminal, Peripheral and Communications Equipment Manufacturing Contacts: Head of Marketing: Tom Ellis Head of Engineering: George H. Geographic Coverage: International Year Established: 1930 Number of Employees: 80,000

THOMAS ENGINEERING

1040 Oak Grove Road Concord, CA 94518 (415) 680-8640 Major Market: Computer and Communications Equipment Manufacturing Head of Marketing: Richard Mondloch Head of Engineering: Douglas Broadwell Geographic Coverage: international Year Established: 1976 Number of Employees: 20

### TICOM SYSTEMS, INC.

Suite 207
13470 Washington Blvd.
Marina Del Ray, CA 90291
(213) 827-7118
Major Markets: Software House
Target Industries: Professional;
Logal; Medical
Terget Applications: Office
Management; WP
Contacts:
Head of Marketing: David Bakstran
Head of Software: George Simons

Head of Engineering: Michael Hadjidonou Geographic Coverage: National Year Established: 1978 Number of Employees: 14

TIE COMMUNICATIONS, INC.
5 Research Dr.
Shelton, CT 08484
(203) 929-7373
Major Market: Communications
Equipment Manufacturing
Target Industries: Telephone;
Interconnect; Supply Houses
Contractas:
Head of Sales: Gilbert Engels
Head of Englesering: Wilbur Brown
Geographic Coverages: International
Year Established: 1971
Number of Employees: 1,000

TIMEPLEX, INC.
400 Chestnut Ridge Road
Woodcilft Lake, NJ 07675
(201) 391-1111
Major Market: Communications
Equipment Manufacturing; CEM
(Computer Systems)
Target Industries:
Taleocommunication; Manufacturing;
Financial; Education
Target Applications: Data
Communications; Networks
Contacts:
Head of Sales: Victoria Brown
Geographic Coverage: International
Year Establishect: 1999
Number of Employees: 750

5991 W. 78th St. Edina, MN 55437 (612) 944-5440 Mejor Market: Communications Equipment Manufacturing; OEM (Computer Systems); Software House; Systems House (Commercial OEM) Target Industries: R&D; Communications Geographic Coverage: National Year Established: 1975 Number of Employees: 13

THIN CORP.
3444 Hancock St.
San Diego, CA 92110
(619) 296-2115
Major Market Peripheral and
Communications Equipment
Manufacturing: Software House
Net Sales: \$100,000 - \$500,000
(1981)
Coentacts:
Head of Marketing: Douglas Gage
Head of Marketing: Douglas Gage

Head of Engineering: Gary Huckell Head of Customer Service: Steve Gage Geographic Coverage: International Year Established: 1977 Number of Employees: 7

TOP DOWN SYSTEMS
Suite 236
414 Hungeford Dr.
Rockville, MD 20850
(301) 251-9400
Major Market: Software House
Contacts:
Head of Marketing: Skip Cashwell
Geographic Coverage: National
Year Establishad: 1980

Number of Employees: 4
TOSHIBA AMERICA, INC.
Telecommunications Division
2441 Michelle Dr.
Tustin, CA. 92880
(714) 730-5000
Major Market: Communications
Equipment Manufacturing
Target Industries:
Telecommunications
Contacts:
Head of Sales: John Demchuk
Geographic Coverage: International
Year Established: 1975

TRANSACTION DATA SYSTEMS, INC. 5750 Major Blvd. Orlando, FL. 32805 (305) 351-1210 Major Market: Software House; Systems House (Commercial OEM) Terget Industries: Pharmacy; Arline; Banking

Airline; Banking Target Applications: Accounting; Message Switching; Package Switching; Virtual Terminal Systems Net Sales: \$1 Million - \$5 Million (1981) Contacts:

Head of Marketing/Sales: Warren Wubker Head of Software: Richard Jones Head of Engineering: Charles Hall Head of Customer Service: Celeste Demetry Geographic Coverage: National Year Established: 1977 Number of Employees: 16

TRAMSEND CORP.
2190 Paragon Dr.
San Jose, CA 95131
(408) 946-7408
Major Market: Component,
Peripheral and Communications
Equipment Manufacturing; Software
House

Terget Applications:
Datacommunications
Contacts:
Head of Marketing: David
Wertzberger
Head of Software: Malcolm Wright
Geographic Coverage: International
Year Established: 1974
Number of Employses: 50

TRANTOR SYSTEMS, LTD. Suite I 4432 Enterprise St. Fremont, CA 94538 (415) 490-3441 Major Market: Peripheral and Communications Equipment Manufacturing Terget industries: Dealers Contacts: Head of Marketing: Ken Batel Head of Customer Service: Susan

Geographic Coverage: intel Year Established: 1981 Number of Employees: 8

TREMBATA STANDARD
MEMORIES CORP.
3400 W. Sagrestrom Ave.
Sarta Ana, CA 92704
(714) 540-360
Major Merket Computer, Terminal,
Peripheral and Communications
Equipment Manufacturing; Systems
House (Commercial OEM);
Dealer/Distributor
Target Industries: OEM;
Government; Education
Contactis:
Head of Marketing/Sales: Miles Efron
Head of Engineering: Emile Worley
Goographic Coverage; International
Year Established: 1996
Number of Employees: 200

TRI-DATA
SOS E: Miclidefield Road
Mountain View, CA 94043
(415) 969-3700
Mejor Market: Component and
Communications Equipment
Manufacturing
Targat Industries: Telephone
Contacts:
Head of Marketing: John Scandalios
Head of Software: Earl Ferguson
Head of Software: Earl Ferguson
Head of Software: Earl Ferguson
Head of Engineering: Ken Krossa
Geographic Coverage: International
Year Established: 1967
Humber of Employees: 100

TRT DATA PRODUCTS
Northfield Communications
3 Depot Place
East Norwalk, CT 0885
(203) 853-277 Mejor Market: Component and
Communications Equipment
Manufacturing; OEM (Computer
Systems)
Contacts:
Head of Marketing: Arnold Benard
Head of Engineering: Ron Kelley
Head of Customer Service: John Ives
Geographic Coverage: International
Year Established: 1999
Number of Employaes: 30

Is your company or product missing from our buyer's guide?

Let us know.

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3

TUCK ELECTROMOS, INC.
30 Second St.
New Cumberland, PA 17070
(717) 781-4354
Major Market: Communications
Equipment Manufacturing; Software
House
Target Industries: Data
Communications; Telephone
Target Anglesidens: Data

Target Applications: Data Communications; Credit Verification Contacts: Head of Marketing: Chris Clugaton Geographic Coverage: International Year Established: 1966

Year Established: 1900

TYBBBHARRE, INC.
Applied Systems Division
6935 Wisconsin Ave.
Bethreade, MD 20815
(301) 951-0122
Major Market Component and
Communications Equipment
Manufacturing: Systems House
(Commercial DEM): Data Services
(Service Bureau)
Contistets
Head of Engineering: Alan Monatch
Geographic Coverage: International
Year Established: 1976
Number of Employees: 35

U. S. ROBOTICS, INC.
1123 W. Washington Blvd.
Suite 1718
Chicago, IL. 60607
(312) 733-0407
Major Market: Communications
Equipment Manufacturing
Target Industries: CEM; Distribution
Contacts:
Head of Marketing: Paul Cowell
Geographic Coverage: National
Year Established: 1976
Number of Employees: 30

JINGERMANN-BASS, INC,
Suite 201
2560 Mission College Blvd.
Santa Clara, CA 95050
(408) 495-0111
Riejor Market: Communications
Equipment Manufacturing
Target Industries: Cross Industry
Contacts:
Head of Marketing: James Jordan
Head of Software: Cary Myman
Head of Costomer Service: Bruce
Jackson
Geographic Coverage: International
Year Established: 1979
Number of Employees: 550

UNIQUE AUTOMATION PRODUCTS
Suite G 15401 Rad Hill Tustin, CA 92680 (714) 730-10102 Major Market Software House Terget Applications: Telecommunications; Word Prücessing Net Sales: \$100,000 - \$500,000 (1982) Geographic Coverage: International Year Established: 1976 Number of Employees: 5

LINEBOFT SYSTEM CORP.
2405 Fourth St.
Berkeley, CA 94710
(415) 644-1230
Major Markets Software House
Net Sales: \$1 Million - \$5 Million
(1982)
Contracts:
Head of Marketing: Bernard
Silverman
Head of Sales: Charles Valente
Head of Marketing: Remand
Geographic Coverage: International
Year Established: 1980
Number of Employees: 20

TECHNOLOGIES/LEXAR

31829 W. La Tienda Dr. Westlake Village, CA 91362 (213) 706-1000 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems); Systems House (Commercial OEM) Target Industries: Manufacturing; Hotels; Professional; Hospitals Target Applications: Voice/Data Integrated Network; Building Systems Management; Voice Telephone: Hotel Systems Contacts Head of Marketing: Harry Schwedock Head of Sales: Larry Evans Head of Engineering: George Oppenheime Geographic Coverage: International Year Established: 1977 Number of Employees: 400

UNIVERSAL DATA SYSTEMS, INC. 5000 Bradford Dr.

Huntsville, AL 35805
(205) 837-5100
(205) 837-5100
Major Markete Communications
Equipment Manufacturing
Tanget Industries: OEM
Contacts:
Head of Marketing: George
Grumbles
Head of Engineering: Lonnie
McMilliam
Geographic Coverage: International
Year Established: 1970
Number of Employees: 600

UNIVERSITY COMPUTING CO.
Applications Software Division
UCC Tower
Exchange Park
Dallas, TX 75235
(214) 353-7100
Major Market: OEM (Computer
Systems), OEM (PeripheralsTerminals), Software House, Data
Services (Service Bureau),
Dealer/Distributor
Target Industries: Cross Industry
Contacts:
Head of Marketing: J. Allen Hufft
Head of Sales: Allan Hufft
Head of Sales: Allan Hufft

Head of Engineering: Hugo Birrer

Head of Customer Service: Roger Pierpoint Geographic Coverage: International Year Established: 1963 Number of Employees: 1,750

USDATA, INC.
1551 Glenville Road
Richardson, TX. 75081
(214) 880-9700
Major Markret: Terminal, Peripheral and Communications Equipment Marufacturing; Systems House (Commercial OEM); Dealer/Distributor
Target Industries: Communication; Process Control; General Business
Target Applications: Communication; Process Control; General Business
Contracts:
Head of Marketing; Gary Kuehneman Head of Sales: Don Perry
Head of Software: Mitchell Vaugh Geographic Coverage; International Year Established: 1974
Number of Employees: 100

USMA COMPUTER CO.
Suite 522
310 4th Ave. S.
Summit Barik Building
Minneapolis, MN 55415
(612) 339-8047
Major Market: Software House;
Data Services (Service Bureau);
Dealer/Distributor
Target Industries: Engineering;
Manufacturing; Banking;
Savings/Loens
Target Applications: Structural
Analysis; Financial Modeling;
Financial Planning; Budgeting
Net Saless: \$100,000 - \$500,000
(1982)
Vesar Established: 1977
Number of Employees: 8

VAN AMBURG & ASSOCIATES,
INC.
4637 Old Seward Highway
Anchorage, AK 99503
(907) 278-3653
Major Market: OEM (Computer
Systems); Software House; Systems
House (Commercial OEM); Data
Services (Service Bureau);
Dealer/Distributor
Terget Industries: Public Safety;
Telephone
Net Sales: \$1 Million - \$5 Million

(1982)
Contacts:
Head of Software: Dave Crawford
Head of Engineering: Steve Czerski
Geographic Coverage: Alaska
Year Established: 1979
Number of Employees: 17

VEIN-TEL, INC.
2342 Walsh Ave.
Santa Clara, CA 95051
(408) 727-5721
Major Market: Communications
Equipment Manufacturing
Contactis:
Head of Marketing: R. Stitt
Head of Marketing: Noth Johnston

Geographic Coverage: International Year Established: 1975 Number of Employees: 100

VERISTROM, INC.
6310 Chillum Place N.W.
Washington, DC 20011
(202) 882-8464
Major Market: Communications
Equipment Manufacturing
Target Industries: Data
Communications; Commercial;
Covernment
Geographic Coverage: International
Year Established: 1958
Number of Employees: 50

VIA WEST, IMC.
990 N. Calle Katrina
P.O. Box 2025
Rogales, AZ 85621
(802) 281-9646
Major Market: Communications
Equipment Manufacturing
Geographic Coverage: International
Year Established: 1972
Number of Employees: 18

VESICOREP
2895 Zanker Road
San Jose, CA 95134
(408) 946-9000
Major Market: Software House
Target Applications: Financial
Planning; Scheduling; Cost Analysis;
Business Graphics
Contacts:
Head of Marketing: David Spencer
Head of Sales: Ben Cushman
Head of Software: Gene Buscheie
Geographic Coverage: International
Year Established: 1978
Number of Employees: 300

VISIOMARY ELECTRONICS, INC., 141 Parker Ave San Francisco, CA 94118 (415) 751-8811 Major Market: Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Systems House (Commercial OEM) Target Industries: Telex; Networking Year Established: 1982 Number of Employees: 4

WANG LABORATORIES, INC.

One Industrial Ave.
Lowell, MA 01851
(817) 459-5000
Major Market-Computer, Terminal,
Peripheral. Communications
Equipment and Office Equipment
Manufacturing
Target industries: Banking;
Insurance; Legal; State/Local
Government
Target Applications: Data Entry;
Electronic Mail; Human Resource
Management; Programmer Utilities
Contacts:
Head of Marketing; Robert Doretti

Head of Software: Frederick Wang

Head of Customer Service: Ray Cullen Geographic Coverage: International Year Established: 1951 Number of Employees: 26,000

WESTERN DATACOM 5083 Market St. Youngtown, OH (216) 788-6583 Major Market: Communications Equipment Manufacturing Target Industries: Financial; Manufacturing Target Applications: Security Systems; Data Communications Established: 1981 ber of Employees: 4

# WESTERN TELECOMPUTING

202 E. Kagy Blvd. Bozeman, MT 59715 (406) 586-1511 Major Market: Computer and Communications Equipment Manufacturing Target Industries: Weather Head of Sales/Marketing: Bob Geographic Coverage: International Year Established: 1969 Number of Employees: 10

### WESTERN TELEMATIC, INC.

2435 S. Anne St. Santa Ana, CA 92704 Major Market: Peripheral and Communications Equipment Manufacturing **Target Industries: Data** Communications; PBX Contacts: Head of Sales: David Shumway Geographic Coverage: International Year Established: 1964 Number of Employees: 20

# WILD HARE COMPUTER

P.O. Box 3581 Boulder CO 80307 (303) 442-0324 Major Market: Software House Net Sales: \$500,000 - \$1 Million (1981) Head of Marketing: Wendy Freeman Head of Software: D. Green Geographic Coverage: International Year Established: 1971 Number of Employees: 10

# WINSOURCE, INC.

5 Northway Lane N. Latham, NY 12101 (518) 783-1336 Major Market: Communications Equipment Manufacturing; OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor Target Industries: General Target Applications: Accounting; Legal-Time Billing; Call-Detail Recording; LAN

Year Established: 1982 Number of Employees: 45

WINTERHALTER, INC. 3853 Research Park Dr. Ann Arbor, MI 48104 (313) 662-2002 Major Market: Software House Target Industries: Fortune 1000 Nat Sales: \$1 Million - \$5 Million (1981)Head of Sales: Bart Castricone Head of Software: Ray Pacek Head of Engineering: Tom Ladish Geographic Coverage: International Year Established: 1978 Number of Employees: 25

### WOLFDATA, INC.

187 Billerica Road Chelmsford, MA 01824 (617) 250-1500 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: Kevin Wiant Geographic Coverage: International Year Established: 1980 Number of Employees: 30

### XEROX CORP

800 Longridge Road P.O. Box 1600 Stamford, CT (203) 329-8700 Major Market: Computer, Terminal, Peripheral and Office Equipment Manufacturing; Software House; Systems House (Commercial OEM) Target Industries: Government; General Business Head of Customer Service: John V. Geographic Coverage: International Year Established: 1906 Number of Employees: 110,000

### XEROX CORP. Office Products Division

1341 W. Mockingbird Lane Dallas, TX 75247 (214) 689-6695 Major Market: Computer and Office Equipment Manufacturing **Target Applications: Office** Geographic Coverage: International

### XYPLEX, INC.

100 Domino Dr. Concord, MA 01742 (617) 371-1400 Major Market: Peripheral and Communications Equipment Manufacturing Target Industries: Banking: Engineering; Retail; Manufacturing Target Applications: Transaction Processing: Industrial Process Control: LAN: Terminal Switching Head of Marketing: Robert

Head of Engineering: George Geographic Coverage: National Year Established: 1981 Number of Employees: 5

## XYQUAD, INC. 1300 Southhampton

St. Louis, MO 63139 (314) 961-5766 Major Market: Communications Equipment Manufacturing Target Industries: Financial: Airline: Head of Marketing: S. Landel Head of Engineering: Fred Stewart Geographic Coverage: National Year Established: 1979 Number of Employees: 3

# ZAIAZ COMMUNICATIONS,

207 Lakin Dr. 35801 Huntsville, AL (205) 881-2200 Major Market: Component and Communications Equipment Manufacturing Target Industries: Lodging; Banks Target Applications: Voice Mail; Dictation; Electronic Mail; Voice Store/Forward Head of Marketing: Ray Keener

Head of Software: Ron Jackson Head of Engineering: Preston Jett Geographic Coverage: Regional Year Established: 1982 Number of Employees: 11

ZIMON ASSOCIATES, INC. 2334 Bronson Hill Dr. Los Angeles, CA 90036 (213) 462-4000 Major Market: Software House; Systems House (Commercial OEM); Dealer/Distributor Target Industries: **Target Applications** Telecommunications Net Sales: \$100,000 - \$500,000

Head of Marketing: William Bales Head of Software: Robert Nelson Head of Customer Service: Royce A. Geographic Coverage: National Year Established: 1980 Humber of Employees: 5

ZOOM TELEPHONICS, INC. 207 South St. Boston, MA 02111

(617) 423-1239

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# **Vendors**

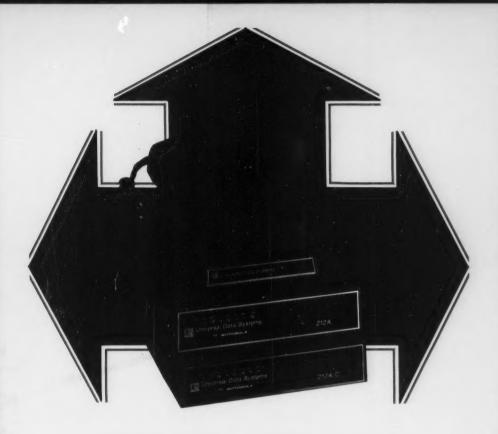
Riejor Market: Communications Equipment Manufacturing Conflicte: Head of Marketing: Ralph Hays Year Established: 1977 Number of Employees: 50

ETEL, INC.
181 Bellarduale St.
Wilmington, MA 01887
(617) 657-8730
Terget Industries: OEM; End User;
Telephone; Interconnect
Target Applications: Voice

Communications; Data Communications; Data Communications; Office Automation; Local-Area Networks Contacts: Head of Marketing: Philip Kay Head of Destomer Service: Tom Robinson Geographic Coverage: International Year Established: 1981 Number of Employees: 200

3 COM CORP. 1390 Shorebird Way Mountain View, CA 94043 (415) 961-9602 Major Market Communications Equipment Manufacturing Contacts Head of Marketing/Sales: John DiLorito Geographic Coverage: International Year Established: 1979 Number of Employees: 50

3M CO. Static Control Systems 3M Center 225-4S St. Paul, MN 55144 (612) 733-1110 Target Applications: Static Control Contacts: Head of Marketing: Philip Kohlhass Head of Sales: Michael E. Martin Head of Engineering: Dr. James A. Totzmann Geographic Coverage: International Year Established: 1982



# UDS gives 212 users three ways to go!

212 LP — Compatible with 212As at the 1200 bps, full-duplex asynchronous communication rate. No power supply or AC connection required; the 212 LP derives its operating power directly from the telephone line. Ideal for applications requiring 212A capability at 1200 bps only. The 212 LP is direct-connect certified.

SINGLE UNIT PRICE ..... \$445

212A/D — Identical to the 212A, with automatic dialing capability added! The unit stores and dials up to five 30-digit numbers. CRT menu prompting, single-stroke commands and automatic test capabilities are provided. The 212A/D is direct-connect certified.

SINGLE UNIT PRICE ..... \$645

## Universal Data Systems



5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/837-8100; TWX 810-726-2100

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## UDS raises the speed limit for dial-up modems

At last there's a 9600 bps modern designed especially for the dial-up telephone network.

Our 9600 A/B is the ideal modern for projected system growth. Realize immediate line-charge savings by moving from 208 A/B to 9600 A/B now! Then, if your system demands dedicated lines, simple strap modifications will convert your modems. Nothing else changes!

A faster turnaround time than 208 A/B's further increases the 9600 A/B's efficiency. Multiple test modes are selectable from the front panel.

Contact Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/837-8100; TWX 810-726-2100.

Universal Data Systems



M MOTOROLA INC. Information Systems Group

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Created by Dayner/Hall, Inc., Winter Park, FL

### Modem Index by Class

The index to modems has been grouped according to device type — couplers, digital, fiber-optic, line driver, long-haul, modem eliminators, radio frequency and shorthaul. The last section of the index includes all other modems which do not fit into any of the above categories. Within each section, products have been listed alphabetically by vendor and contain the unit price and the page number on which the listing can be found.

The modem product listings have been arranged alphabetically by vendor.

## **Acoustic Couplers**

VENDOR	MODEL	PRICE	PAG
Anderson Jacobson, Inc.	AJ 242A	N/A .	A-1
	AJ 247	NA .	A-1
	AJ 1232	\$635 .	A-1
Atari, Inc	ATARI 1030 DIRECT CONNECT MODEM	N/A .	A-1
Backus Data Systems	AC 312 1200B	\$495 .	A-1
	AC 312 300B	\$199 .	A-1
Com Data	151A2-13	\$127 .	A-2
Develon Electronics, Inc.	710 ACOUSTIC COUPLER	\$195 .	A-2
Digital Equipment Corp	DF01-A ACOUSTIC COUPLER	\$345 .	A-2
Envax Corp.	ACOUSTIC COUPLER, N78	\$195 to \$225 .	A-2
International Data Sciences, Inc	PHONE LINK ACOUSTIC MODEM	\$189 .	A-3
Lexicon Corp. of Miami	LEX-11	\$145 .	A-
•	LEX-11 CCI II	\$176 .	A-S
	LEX-11 CCI IIB	\$216 .	Ad
	LEX-11B	\$185 .	AN
	LEX-12	\$165 .	
	LEX-12B	\$205 .	A-
	LEX-15	\$325 .	AN
	LEX-15B	\$395 .	
Hoakes Data Communications, Inc			A-
•	N76/5-2	\$170 .	A-
Novation, Inc.	CAT	\$189 .	A-
	CCITT CAT		A~
Racal-Vadic	VA3413		A-
Tandy Corp.	AC- 26-1174		A-
Tek-Com, Inc.	TC3001	\$195 to \$265 .	A-
	TC3002		A-
	TC3006		A-

## **Digital Modems**

VENDOR	MODEL	PRICE	PAG	Æ
Amdahl Corp.	983 DSU	\$645 to \$745	A-1	11
	GDC 500A/58K			
	GDC GSU-500A	\$695	A-3	30
	GSU-500B	NA	A-3	30
Nasco	DSU/CSU 1600R-4	\$1,125	A-4	15
	DSU/CSU 1600R-3			
	DSU/CSU 1600R-5			
Schneider Instrument Co				
	TP-500			
	TP-501			
	TP-556			
	TP-557			

## Fiber-Optic Modems

VENDOR	MODEL	PRICE	PAGE
Beiden Corp.	BIT-DRIVER 22-005	\$195	A-15

th Electronic Products, Inc.  LIMITED DISTANCE MODEM MODEL 6 (LDM-6)  \$195 ack Box Catalog/Expandor, inc.  BELL-COMPATIBLE MODEM 212  \$595 brill 17 to \$296 brill 250 to \$200  30-0078  \$150 to \$200  30-0080  \$150 to \$200  10090  \$150 to \$200	NDOR	MODEL PRICE	P.
BIT DRIVER 222005   \$225	elden Corn.	BIT-DRIVER 222-004 \$225	
BIT DRIVER 22005   \$185	oadband Systems, Inc.	BIT DRIVER 222004 \$225	
CSY-306-A-S.   \$1,500		BIT DRIVER 222005	
CSY-306-A-S.   \$1,500	moss Data Systems	CSA-100	
CSY-306-S		CSY-306-A-S \$1,500	
CSY-305AA-R   \$1,200		CSY-306-S	
CODELINK 80   S500		CSY-3063AX-R \$1,200	
CODELINK 80   S500	denoil Technology Corp.	CODELINK 10	
CODELINK 50		CODELINK 20	
CODE_INK 100		CODELINK 50	
March   Marc		CODELINK 100 \$3,000	
March   Part   March	ronics International, Inc.		
Main   Section			
FSI	ndalf Data, Inc.		
March   Fold   Same   Fold   Same   Fold   Same   Fold   Same   Fold			
## Associates, Inc. ## Ass	nage, Inc	FOM-232A	
AND		FOM-1232 \$325	
All	th Associates, Inc.		
A   10		XR-1100 \$410	
14 2    \$160	telecom	4110	
Po-10K   \$1,200   Po-56K   NA   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   \$1,000   Po-56K   NA   Po-1200   \$1,000   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   NA   Po-1200   \$1,000   Po-56K   Po-56			
FD-20K	tical Communications Corp		
FD-58K			
FD-1200		FD-56K	
DOS-201   \$625   ODS-209   \$725   ODS-209			
ODS-209   \$725   ODS-306   \$1,750   ODS-306   \$1,750   ODS-306   \$1,750   ODS-306   \$1,750   ODS-306   \$250   S250   S	alo Corp.		
ODS-306   \$1,750		ODS-209	
2000   \$250   \$250   \$350			
2200   \$350   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000   \$3520   3000	yoom Systems, Inc.	2000	
Sample			
Company			
Line Drivers	eletron Inc		
ack Box Catalog/Expandor, Inc.  BELL-COMPATIBLE MODEM 212  \$595 cm Data  monitor  150 cm Data	NDOR		P
Section   Sect		MODEL PRICE	
30-0076   \$150 to \$200	k Electronic Products, Inc.	MODEL PRICE LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$193	
30-0080   \$150 to \$200	k Electronic Products, Inc.	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$795           BELL-COMPATIBLE MODEM 212         \$595	
Same	k Electronic Products, Inc. ack Box Catalog/Expandor, Inc. m Data	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$193           BELL-COMPATIBLE MODEM 212         \$359           350/352/354F3-72         \$117 to \$296	
ADT-3   \$225	k Electronic Products, Inc. ack Box Catalog/Expandor, Inc. m Data	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$795           BELL-COMPATIBLE MODEM 212         \$595           350/352/354F3-72         \$117 to \$200           30-0078         \$150 to \$200	
LDS 100C   \$225   LDS 101   \$400   S20	k Electronic Products, Inc. nck Box Catalog/Expandor, Inc. m Data mputrol	MODEL	
LDS 101   \$400	k Electronic Products, Inc. nck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc.	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$199           BELL-COMPATIBLE MODEM 212         \$593           350/352/354F3-72         \$117 to \$290           30-0078         \$150 to \$200           30-0078         \$150 to \$200           DDU-1         \$750 to \$200	
LD 210/AS   \$210	k Electronic Products, Inc. nck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc. 1-Teleproducts, Inc.	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$195           BELL-COMPATIBLE MODEM 212         \$593           \$50/352/354F3-72         \$117 to \$296           30-0078         \$150 to \$200           30-0080         \$150 to \$200           DDU-1         \$799           ADT-3         \$222	
LD 210/SA   \$350	k Electronic Products, Inc. nck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc. 1-Teleproducts, Inc.	MODEL	
SAB-2X4   \$456	k Electronic Products, Inc.  ck Box Catalog/Expandor, Inc.  m Data  mputrol  taproducts New England, Inc.  1-Teleproducts, Inc.  mdalf Data, Inc.	MODEL         PRICE           LIMITED DISTANCE MODEM MODEL 6 (LDM-6)         \$798           BELL-COMPATIBLE MODEM 212         \$599           350/352/354F3-72         \$117 to \$298           30-0078         \$1550 to \$200           DDU-1         \$790           ADT-3         \$222           LDS 100C         \$222           LDS 1011         \$400	j
M400MP   \$220   M420MP   \$320   M430   \$85   M430MP   \$320   M430   \$85   M430   \$85   M430   \$85   M430   \$85   M430   \$85   M430	k Electronic Products, Inc.  ck Box Catalog/Expandor, Inc.  m Data  mputrol  taproducts New England, Inc.  1-Teleproducts, Inc.  mdalf Data, Inc.	MODEL	
M420MP   \$220	k Electronic Products, Inc. sck Box Catalog/Expendor, Inc. spatia mputrol taproducts New England, Inc. 3-Teleproducts, Inc. spatial Data, Inc. otron Systems Corp.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198  BELL-COMPATIBLE MODEM 212 \$598  \$50/352/354F3-72 \$117 to \$290  30-0078 \$150 to \$200  DOU-1 \$750 to \$200  DOU-1 \$799  ADT-3 \$220  LDS 100 \$220  LDS 101 \$400  LD 210/AS \$210  LD 210/AS \$210  \$210  LD 210/AS \$210  \$210  LD 210/AS \$210  \$210  LD 210/AS \$210  \$210  \$210  LD 210/AS \$210  \$210	
M430   \$85	Electronic Products, Inc.  Ick Box Catalog/Expandor, Inc.  In Data Inputrol  taproducts New England, Inc.  1-Teleproducts, Inc. Incal Data, Inc.  otron Systems Corp.  Inc. Corp.	MODEL	5
ALD/1 \$200 to \$300   HSLD/1 \$390 to \$400   HSLD/1 \$390 to \$400 to \$400   HSLD/1 \$100 to \$165   T4A SHORT HAUL MODEM WITH HANDSHAKE \$165   T9 DUAL SHORT-HAUL MODEM WIRE HANDSHAKE \$225   HIsbs, Inc. 3010 \$100   HISBS, Inc. 100 to \$100   HISBS, INC.	Electronic Products, Inc.  Ick Box Catalog/Expandor, Inc.  In Data Inputrol  taproducts New England, Inc.  1-Teleproducts, Inc. Incal Data, Inc.  otron Systems Corp.  Inc. Corp.	MODEL	3
HSLD/1   \$390 to \$490	Electronic Products, Inc.  Ick Box Catalog/Expandor, Inc.  In Data Inputrol  taproducts New England, Inc.  1-Teleproducts, Inc. Incal Data, Inc.  otron Systems Corp.  Inc. Corp.	MODEL	5
Iebyte Technologies, Inc.	k Electronic Products, Inc. sck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc. 3-Teleproducts, Inc. ndaif Data, Inc. surron Systems Corp. sex Corp. sex Corp. sex Corp. sex Systems, Inc.	MODEL	
74A SHORT HAUL MODEM WITH HANDSHAKE \$165 79 DULL SHORT-HAUL MODEM WIRE HANDSHAKE \$225 18 ins inc 3010 \$100 1 \$100 1 \$100 1 \$150	k Electronic Products, Inc. sck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc. 3-Teleproducts, Inc. ndaif Data, Inc. surron Systems Corp. sex Corp. sex Corp. sex Corp. sex Systems, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL_COMPATIBLE MODEM 212 \$599 \$503(552)545-72 \$117 to \$209 30-0078 \$150 to \$200 00-1 \$750 to \$200	
Ilabs, Inc.   79 DUAL SHORT-HAUL MODEM WIRE HANDSHAKE   \$225	i Electronic Products, Inc.  leck Box Catalog/Expandor, Inc.  m Data  mputrol  taproducts New England, Inc.  -1-Teleproducts, Inc.  otron Systems Corp.  leck Corp.  com Systems, Inc.  entice Corp.	MODEL	5
Illahs, Inc.   3010   \$100	i Electronic Products, Inc.  leck Box Catalog/Expandor, Inc.  m Data  mputrol  taproducts New England, Inc.  -1-Teleproducts, Inc.  otron Systems Corp.  leck Corp.  com Systems, Inc.  entice Corp.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6) \$199 BELL-COMPATIBLE MODEM 212 \$599 \$50/352/3545-72 \$177 \$50/352/3545-72 \$177 \$50/352/3545-72 \$177 \$50/352/354-72	
LDD-1	i Electronic Products, Inc.  leck Box Catalog/Expandor, Inc.  m Data  mputrol  taproducts New England, Inc.  -1-Teleproducts, Inc.  otron Systems Corp.  leck Corp.  com Systems, Inc.  entice Corp.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6) \$199 BELL-COMPATIBLE MODEM 212 \$599 \$50/352/3545-72 \$177 \$50/352/3545-72 \$177 \$50/352/3545-72 \$177 \$50/352/354-72	
SLD-1	Electronic Products, Inc.  Inc. Inc.  Inc. Inc.  Inc. Inc.  Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL_COMPATIBLE MODEM 212 \$598 550/352/3545-72 \$117 to \$298 30-0878 \$150 to \$200 30-088 \$150 to \$200 DDU-1 \$150 to \$200 DDU-1 \$798 ADT-3 \$222 LDS 100C \$222 LDS 101 \$400 LDS 101 \$400 LDS 101 \$400 LDS 101 \$400 LDS 101 \$300 ABD-24 \$355 AB-2X4 \$584 M400MP \$222 M430 \$88 ALD/1 \$200 to \$300 HSLD/1 \$200 to \$300 HSLD/1 \$200 to \$300 HSLD/1 \$390 to \$490 72D, VT-100 COMPATIBLE SHM \$140 74A SHORT HAUL MODEM WITE HANDSHAKE \$162 7500 TO \$100 FS 202 FS 202 FS 203 FS 204 FS 205 FS	5
### ALD SERIES \$205 to \$320  SLD-SERIES \$380 to \$450  SLD-SERIES \$380 to \$450  103 MODEM #507 \$390  103 MODEM #506 \$225  SATELLITE MODEM #508 \$275  **Long-Haul Modems**  **Long-Haul Modems**  **MODEL PRICE   PRICE    Schor Automatice, Inc. MARK II SIGNALMAN \$99	t Electronic Products, Inc.  ck Box Catalog/Expendor, Inc.  m Data  mputrol  taproducts New England, Inc.  1-Teloproducts, Inc.  molalf Dats, Inc.  otron Systems Corp.  com Systems, Inc.  entice Corp.  com Systems, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL-COMPATIBLE MODEM 212 \$598 350/352/354F3-72 \$117 to \$290 350/352/354F3-72 \$150 to \$200 DDU-1 \$150 to \$200 DDU-1 \$150 to \$200 DDU-1 \$550 to \$200 LDS 101 \$200 LDS 101 \$400 LD 210/SA. \$221 LD 210/SA. \$354 LD 210/SA. \$354 M400MP \$222 M430 \$354 M400MP \$222 M430 \$584 M410 \$584 M420MP \$322 M430 \$584 M420MP \$322 M430 \$586 ALD/1 \$200 to \$500 HSLD/1 \$390 to \$490 HSLD/1 \$390 to \$490 HSLD/1 \$390 to \$490 HSLD/1 \$390 to \$490 TZD, VT-100 COMPATIBLE SHM \$136 79 DUAL SHORT HAUL MODEM WITH HANDSHAKE \$166 79 DUAL SHORT-HAUL MODEM WITH HANDSHAKE \$220	5
SLD-SERIES   \$380 to \$450	t Electronic Products, Inc.  ck Box Catalog/Expendor, Inc.  m Data  mputrol  taproducts New England, Inc.  1-Teloproducts, Inc.  molalf Dats, Inc.  otron Systems Corp.  com Systems, Inc.  entice Corp.  com Systems, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL_COMPATIBLE MODEM 212 \$598 550/352/3545-72 \$117 to \$298 30-078 \$150 to \$200 30-078 \$150 to \$200 100-1 \$150 to \$200 100-1 \$150 to \$200 100-1 \$150 to \$200 100-1 \$100 100-1	5
103 MODEM #507   \$390     103 MODEM #506   \$825     103 / 12 MODEM #506   \$825     SATELLITE MODEM #508   \$275     Long-Haul Modems     NDOR	k Electronic Products, Inc.  nck Box Catalog/Expendor, Inc.  m Data mputrol  taproducts New England, Inc.  1-Teleproducts, Inc.  notion Systems Corp.  nex Corp.  com Systems, Inc.  netice Corp.  inhyte Technologies, Inc.	MODEL	
103/12 MODEN #506 \$825 SATELLITE MODEM #508 \$275  Long-Haul Modems  NDOR MODEL PRICE   Incher Automation, Inc. MARK II SIGNALMAN \$99	k Electronic Products, Inc.  nck Box Catalog/Expendor, Inc.  m Data mputrol  taproducts New England, Inc.  1-Teleproducts, Inc.  notion Systems Corp.  nex Corp.  com Systems, Inc.  netice Corp.  inhyte Technologies, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL_COMPATIBLE MODEM 212 \$598 550/352/3545-72 \$117 to \$299 30-0078 \$150 to \$200 30-0080 \$150 to \$200 DDU-1 \$150 to \$200 DDU-1 \$750 to \$200 DDU-1	
SATELLITE MODEM #508 \$275  Long-Haul Modems  NDOR MODEL PRICE   Solutions attorn, Inc. MARK II SIGNALMAN \$99	k Electronic Products, Inc. nck Box Catalog/Expandor, Inc. m Data mputrol taproducts New England, Inc. 1-Teleproducts, Inc. notion Systems Corp. nex Corp. com Systems, Inc. netice Cerp. leibyte Technologies, Inc.	MODEL	
NDOR MODEL PRICE cher Automation, Inc. MARK II SIGNALMAN \$99	Electronic Products, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198  BELL-COMPATIBLE MODEM 212 \$598  350/352/354F3-72 \$117 to \$298  350/352/354F3-72 \$117 to \$298  30-0078 \$150 to \$200  DDU-1 \$759  ADT-3 \$222  LDS 100C \$222  LDS 101 \$400  LD 210/AS \$270  LD 210/AS \$270  LD 210/AS \$270  AMT-3 \$224  M400MP \$222  M430 \$384  M400MP \$322  M430 \$884  ALD/1 \$200 to \$300  HSLD/1 \$200 to \$300  HSLD/1 \$390 to \$400  T2D. VT-100 COMPATIBLE SHM \$100  T2D. VT-100 COMPATIBLE SHM \$10	
NDOR MODEL PRICE cher Automation, Inc. MARK II SIGNALMAN \$99	Electronic Products, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198  BELL-COMPATIBLE MODEM 212 \$598  350/352/354F3-72 \$117 to \$298  350/352/354F3-72 \$117 to \$298  30-0078 \$150 to \$200  DDU-1 \$759  ADT-3 \$222  LDS 100C \$222  LDS 101 \$400  LD 210/AS \$270  LD 210/AS \$270  LD 210/AS \$270  AMT-3 \$224  M400MP \$222  M430 \$384  M400MP \$322  M430 \$884  ALD/1 \$200 to \$300  HSLD/1 \$200 to \$300  HSLD/1 \$390 to \$400  T2D. VT-100 COMPATIBLE SHM \$100  T2D. VT-100 COMPATIBLE SHM \$10	
schor Automation, Inc. MARK II SIGNALMAN \$99	k Electronic Products, Inc. nck Box Catalog/Expendor, Inc. m Data mputrol  ttaproducts New England, Inc. 11-Teleproducts, Inc. notalif Dats, Inc. lotron Systems Corp. nex Corp. com Systems, Inc. entice Corp. inibyte Technologies, Inc.	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198  BELL-COMPATIBLE MODEM 212 \$598  350/352/354F3-72 \$117 to \$298  350/352/354F3-72 \$117 to \$298  30-0078 \$150 to \$200  DDU-1 \$759  ADT-3 \$222  LDS 100C \$222  LDS 101 \$400  LD 210/AS \$270  LD 210/AS \$270  LD 210/AS \$270  AM-400MP \$222  M430 \$384  M400MP \$222  M430 \$884  ALD/1 \$200 to \$300  HSLD/1 \$200 to \$300  HSLD/1 \$300 to \$300  HSLD/1 \$300 to \$400  HSLD/1 \$300 to \$400  HSLD/1 \$300 to \$300  HSLD/1 \$300 to \$300  S80  ALD/1 \$300 to \$400  TZD. VT-100 COMPATIBLE SHM \$100  TZD. VT-100 COMPATIBLE SHM \$300 to \$400  TZD. VT-100 COMPATIBLE SHM \$300 to \$400  TZD. VT-100 SMP WITH HANDSHAKE \$600  \$100 to \$300  SSE2  SSE2  SSE2  SSE2  SSE2  SSE3	
	k Electronic Products, Inc. ack Box Catalog/Expandor, Inc. mr Data mputrol staproducts New England, Inc	MODEL PRICE  LIMITED DISTANCE MODEM MODEL 6 (LDM-6). \$198 BELL_COMPATIBLE MODEM 212 \$598 350/352/354F3-72 \$1717 to \$290 30-0078 \$150 to \$200 000-000 \$750 to \$200 000-1 \$750 to \$200 000-1 \$222 LDS 100C \$222 LDS 101 \$400 LD 210/AS \$221 LDS 101 \$400 LD 210/AS \$221 LD 210/AS \$221 LD 210/AS \$222 LDS 101 \$300 LD 210/AS \$222 LDS 101 \$300 LD 210/AS \$222 LDS 101 \$300 LD 210/AS \$221 LD 210/AS \$221 LD 210/AS \$222 LDS 100 \$300 LD 210/AS \$300 LD 210	
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NDOR	MODEL PR	CE		PAG
nchor Automation, Inc.	MARK X SIGNALMAN \$1	189		
	MARK XII SIGNALMAN	399		
	VOLKSMODEM			
nderson Jacobson, Inc	AJ 4048			
zcomp	MODEL 1012 \$6	649		A-1
	MODEL 1022 \$2	249		A-1
	MODEL 1080 \$	139		A-
	MODEL 2120 \$	499		A-
proughs Corp	CP 1004	NIA		A-
	CP 1009	NIA		A-1
	CP 1009-R/T			
	TA 1201			
	TA 1203			
	TA 1801			
	TA 1802/1804			
toom, Inc.	212 AD			
tel		905		A.
ung Telecommunications	TURBO MUX	202		4
ung terecommunications	TURBO 212A \$	200		7
dex Corp	224 DATA MODEM			
dex Gorp				
	224/V.22 BIS DATA MODEM	NIA		A-
	5016R MULTIPLE MODEM ENCLOSURE			
	5103/5113 DATA MODEMS	NIA		A
	5201R DATA MODEM	NA	*******	A
	5202R V.23			
	5208R DATA MODEM			
	5212/ACU			
	5212R	NIA		A
	8300 GBM	NIA		A
	CS 48FP \$4,	175		A
	CS 96FP	475		A
	CS 4800			
	CS 9600 \$7.			
	LSI 24/24 \$2			
	LSI 48FP \$3,			
	LSI 48I	500		7
	LSI 48/V.27 BIS/TER	500		- 7
	LSI 96FP			
	LSI 96/V.29	NIA		A
	LSI 4800 \$3,			
	LSI 9600			
	LSI E96/V.29			
	LSI E9600			
	LSI E9604	NIA		. A
	MX 2400 DATA MODEM			
	SP 14.4	NA		. A
herent Communications Systems Corp	SPM-94A	500		A
m Data	154E2-14\$	127	********	. 1
	208 A/B	697		A
	212E2-32			
	302A2-13			
	302A2-33			
	302B2-13			
	302B2-33			
	302C2-13L			
	305E2-12	1117	*********	
	312E2-42	397		. 1
	312F2-22L			
	330E2-12L\$	1137		. 1
	330E2-42L\$	1197		. 1
		187		. 1
	332E2-12L	2047		. 1
	332E2-12L			
	332E2-42L			. 1
	332E2-42L	591		
	332E2-42L	591 537		. A
	332E2-42L	591 537 587		. 1
	332E2-42L	591 537 587 227		. 4
	332E2-42L	591 537 587 587 227 277		. 4
	332E2-42L	\$591 \$537 \$587 \$227 \$277 \$595		. A A
·mDesign, Inc.	332E2-42L 332F7/332F8 334E2-12L 370E2-12 PHONEM 370E2-42 9 212 A 9 212 A \$495 to \$7111.	\$591 \$537 \$587 \$227 \$277 \$595 \$750		. A A A A
mDesign, Inc.	332E2-42L 3332F7/332F8 334E2-12L 334E2-212L 370E2-12 PHONEM 370E2-2 PHONEM 370E2-42 72 A 5495 to 3 7TM-1200 7TM-2400	\$591 \$537 \$587 \$227 \$277 \$595 \$750		
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	332E2-42L 3332F7/332F8 334E2-12L 334E2-212L 370E2-12 PHONEM 370E2-2 PHONEM 370E2-42 72 A 5495 to 3 7TM-1200 7TM-2400	\$591 \$537 \$587 \$227 \$277 \$595 \$750 \$750		. A A A A
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ommodore Business Machinino.	332E2-42L 3332FB 334E2-12L 370E2-12 PHONEM 370E2-12 PHONEM 370E2-42 972E4-2 370E2-40 972E4-0 9	\$591 \$587 \$587 \$227 \$595 \$750 \$750 \$750 \$750 \$750 \$750		. A . A . A . A . A . A . A
ommodore Business Machine Inc.	332E2-42L 3332FB 334E2-12L 370E2-12 PHONEM 370E2-12 PHONEM 370E2-42 972E4-2 370E2-40 972E4-0 9	591 537 587 227 277 595 750 750 750 750 N/A		. A . A . A . A . A . A . A . A
ommodore Business Machi Inc. ompre Communications, Inc. omputer Communications Specialists, Inc.	332E2-42L 333E7/332F8 334E2-12L 370E2-12 PHONEM 370E2-42 9 212 A 9 212 A 9 495 to 5 TM-1200 9 1TM-2400 1TM-3600 1TM-9600 1TM-9600 150 150 150 150 150 150 150 1	\$591 \$537 \$587 \$227 \$595 \$750 \$750 \$750 \$750 \$750 \$750 \$750 \$75		A A A A A A A A A A
	332E2-42L 333E7/332F6 334E2-12L 370E2-12 PHONEM 370E2-42 970E2-42 970E2-42 970E2-42 970E2-40 970E	\$591 \$537 \$587 \$227 \$595 \$750 \$750 \$750 \$750 \$750 \$750 \$750 \$75		. A . A . A . A . A . A . A . A . A . A

IDOR	MODEL PRICE	P/	AG
mapec, Inc.	DATATALKER 9600C N/A		4-7
mtech Data Corp.			4-2
mission water conjunction of the	GB 168 \$17.500		4-2
	M700 \$4,650		4-5
	SM200A \$14,300		4-7
mtech Data Corp	MF 05		4-5
noord Data Systems, Inc.	CDS 212 \$700		4-7
noura bata ayetems, mo	CDS 224 \$995 to \$1,195		4
	CDS 224 TM		4
	CDS 224 TM AUTODIAL \$1,195		4
	CDS V.22		
	CDS V.22 BIS		
	CDS V.22 BIS AUTODIAL \$1,195		4
	CUS V.ZZ BIS AUTUDIAL		-
tagram Corp	D 2400 \$995 D 4800 \$1,750		4
tapoint Corp	9478/9479		47
	MDR 103		
tec, Inc.	33 \$195 to \$599		4.
	212 \$195 to \$599		4-
	PAL 103 \$195 to \$599		A-
	PAL 212 \$195 to \$599		4-
	PAL PLUS \$195 to \$599		A.
velcon Electronics, Inc	2X212 MODEMPLEXER		4
	6212 SMART MODEM \$495		A.
	7212 MODEM		A.
	8212 SMART MODEM \$650		Ą
	9123 MODEM		Ą
Ital Equipment Corp	DF02-AA/AC\$450 to \$650		Ą
	DF03-AA/AC \$895 to \$1,095		A
	DF03-RA/RC \$750 to \$950		A
troi Systams, inc	LYNX 103-0AA \$299		A
	LYNX 103-0AA (APPLE LYNX)		A
rax Corp.	103-1		A
	103-2 \$175 to \$485	5	A
	103-3	5	A
	103-5	5	A
cson Progmatic, inc	ZAT 1200 \$950	3	A
	ZAT 2400		
	ZAT 4800		
	ZAT 9600\$2,195		
adman Associates	NEC 201 \$620		
	NEC 201 CR \$645	5	A
	NEC 202T	5	A
	NEC 212 \$500		
	NEC 212 AR		
	NEC 212 BR		
	NEC DSP 4800-U		
	NEC DSP 9600-U\$1,500	0	Ĭ
	NEC VOICE DIGITIZER \$7.000		
Itsu America, Inc.			
iteu America, inc	F-1921L \$2.45		
	F-1925L \$6,000		
	P*1923L		1
	M-1915CM06 \$399 M-1921CM08 \$599	6	4
	M-1925CM02 \$1,20		
	M-1925CM02 \$1,50 M-1925CM03 \$1,50		
ndalf Data, Inc			4
	SAM 212A \$61.		
	SM 9600		
noral Datacomm Industries, Inc.	DC 103J N/	A	
	DC 108-3M		
	DC 201-7		
	DC 201C		
	DC 201C-K \$75	0	j
	DC 202S/T \$40		
	DC 208B/A	5	
	DC 212A	0	j
	DC 2400ASM \$79	5	
	DC 4800 \$1,47	5	
	DC 4800S	5	
	DC 4827 N/.		
	DC 9600		
	DC 9600 EP\$2,73		
	DC 9600 OP \$2.99	15	b
	DC 9600 QP\$2,99		
	DC 9600 QP \$2,99 DC 9600 QPS N/I GDC 103J-M \$24	A	

VENDOR	MODEL PRICE	PAGE
General Detecomm Industries, Inc.	GDC 212SS	5 A-31
	GDC 2400 ED	4 4-32
	GDC 9604 WITH 4-CHANNEL MULTIPLEXER	5 A-32
Gtech Corp	CM 7201A	2 A-32
	GSC 202 N/	1 A-32
Hayes Microcomputer Products, Inc	MICROMODEM IIE \$320	) A-32
	MICROMODEM 100 \$39	A-32
	SMARTMODEM 300	3 A-32
	SMARTMODEM 1200 . \$69: SMARTMODEM 1200B . \$59:	2 A-33
Honeywell, Inc.	DCD2021 \$49:	# A-33
riotra y won, inc.	DCD2011	6 A-99
	DCD2012	
	DCD2021	6 A-35
	DCD2121 \$80	
IDM	MODEL 3863-1	5 A-33
	MODEL 3863-2	5 A-33
	MODEL 3864-1	5 A-34
	MODEL 3864-2	5 A-34
	MODEL 3865 MODEL 182	5 A-34
	RACK-MOUNTED MODEM 3868 MODEL 1 \$2,550 to \$5,00	0 A-34
	RACK-MOUNTED MODEM 3868 MODEL 2         \$2,550 to \$5,00           RACK-MOUNTED MODEM 3868 MODEL 3         \$2,550 to \$5,00	0 A-34
	RACK-MOUNTED MODEM 3868 MODEL 3	0 A-34
IDE Associatos, Inc.	IDEACOMM 1200\$54	5 4-36
Infinet, inc.	NCM 14.4	A 4-30
-	NCM 1200	0 A-34
	NCM 2400	0 A-34
	NCM 4800	O A-34
	NCM 9600	O A-34
Infotron Systems Corp	DL 96/V.29 \$4,50	0 A-35
	DL 201C	0 A-35
	DL 9600/V.29 BSM	0 A-38
	DSM 201C	5 A-38
Integrated Design Engineering, Inc	IDE-300\$50	0 A-96
Interbusiness Corp.	212A	6 A-90
	A1200	9 A-35
	AC 300 \$18	9 A-35
	AUTO DIAL 212A \$59	9 A-38
	M1200	
	OEM NI.	A A-36
	S-100\$44	9 A-36
International Buts Buts and the	STARCOM\$44	9 A-36
International Data Sciences, Inc	AUTO LINK 212	9 A-38
	AUTODIAL 212 \$59	0 A-96
	MICRO LINK 300	
	MICRO LINK 1200\$44	9 4-37
	PASSWORD AUTODIAL 212A MODEM	9 A-37
International Modern Exchange (Timecor)	THE OPERATOR	9 A-37
Kinex Corp.	2400/FDX N/.	A A-31
	4800/208/AB	
	4800/27	5 A-38
	9600/29 \$2,75 9600/DCM (DATA COMPRESSION MODEM) \$3,65	U A-38
	9600/DCM (DATA COMPRESSION MODEM)	0 A-36
	9600/M	O A-90
Lexicon Corp. of Miami	LEX-10	9 4-30
	LEV.109	0 4-94
MFJ Enterprises	MFJ 1233 \$12	9 4-31
Micom Systems, Inc.	M4024, M4024/ASYNC	5 A-40
	M4048/DB+	5 A-40
	M4048/V.27 +	5 A-40
	M4048/V.27-NF \$1,75	0 A-40
	M4096/4+ \$3,69	
	M4096/DB+ \$3,79 M4096-NF \$2,69	5 A-40
	M4096/V.29+ \$3,09	5 A-40
Micro-Baud Systems, Inc.	80512	0 4-4
	90514	16 A 41
The Microperipheral Corp	AUTOPRINT MICROCONNECTION	19 A-43
•	RS232	19 A-43
	SUBMINIATURE OEM MODEM	30 A-43
	TRS 80 MODEL 1 \$200 to \$25	O A-45
Modular Integration, Inc	MSM-690	A A-4
Multi-Tech Systems In-	HI53 GROUP DATA MODEM	A A-4;
muiti - 1ech Systems, Inc	MT 103J \$25	U A-4

IDOR	MODEL PRICE		PA
iti - Tech Systems, Inc.	MT 201B \$685		A
	MT 202T		A
	MT 212AD \$695		A
	MT 212AH		A
	MT 212C		
	MT 212PC		A
R Comton,inc	NCR COMTEN 7163 0100 N/A	*******	^
	NCR COMTEN 7163 0200 N/A		
	NCR COMTEN 7164 0100 \$3,700		A
	NCR CONTEN 7164 0200		A
	NCR COMTEN 7165 0100		A
Telephone, Inc.	B103JR \$460		
s raightfund me	DSP 208		A
	DSP 224 \$1,195		- 7
	DSP 4800-U\$1,695		
	DSP 9600-U\$2,695		
	N113C-DR		A
	N201C \$845		A
	N201CR		4
	N202SR \$495		
	N202T \$400		
	N212AR		. A
	N212BR\$795		
	SP1440-U \$7,800		. 1
	SP9600-FAST-U \$5,300		. 1
	SPN 4800-U \$3,500		. 4
	SPN 9600-U \$7,000		
work Broducto Inc	NP-48\$1,800		
HUR PTOGUETS, INC	NF-90	********	
	NP-96		
kes Data Communications, Inc	N103-3		. 1
	N103-4 N/A		. 1
thern Telecom, Inc.	2230		. 4
	2240 \$850		
	2250		
	0000 0000		
	2260	********	. 4
ation, Inc.			. 4
	103 SMART-CAT \$249		
	103/212 SMART-CAT		. 1
	212 AUTO-CAT \$695		. 4
	APPLE-CAT II \$389		. 1
	D-CAT \$199		
	J-CAT \$149		. 4
	PC1200B		
Data Corp.	108		. 4
adyna Corporation			
	CHALLENGER 4800		
	CHALLENGER 9600\$2,600		
	DTU-1200D N/A		
	LSI 24C N/A		
	MP 14.4		
	MP 14.4 SM N/A		
	MP 16.0		
	MP 48/208B		
	MPX 2400	2	
	MPX 4800		
	MPX 9600		
rill Corp			
The second secon	300/1200 AUTO DIAL		
			•
	1800 DED	8	
	1800 DED \$37: 2127 \$1,69:	5	
	1800 DED \$37: 2127 \$1,69 2129 \$2,59	5	
	1800 DED     \$37'       2127     \$1,69       2129     \$2,59       8201 A/B     \$1,75'	5	
ntice Corp.	1800 DED     \$37.       2127     \$1,69       2128     \$2,59       8201 A/B     \$1,75       212 TCM     \$595 to \$79	5	
ntice Corp.	1800 DED     \$37'       2127     \$1,69       2129     \$2,59       8201 A/B     \$1,75'	5	
ntice Corp.	1800 DED     \$37.       2127     \$1,69       2129     \$2,59       8201 A/B     \$1,75       212 TCM     \$6955 to \$79       \$600A/B     \$2,99	5	
ntice Corp.	1800 DED     \$37.       2127     \$1.89.       2129     \$2.59.       8201 AB     \$1.75.       212 TCM     \$695 to \$79.       9600AB     \$2.99.       9629     \$2.560 to \$2.99.	5	
ntice Corp.	1800 DED     \$37.       2127     \$1,69       2129     \$2,59       8201 AB     \$1,75       212 TCM     \$695 to \$7.9       9600A/B     \$2,99       9629     \$2,650 to \$2,75       P-V 22     \$6950 to \$2,89	5	
ntice Corp.	1800 DED     \$37.7       2127     \$1.89.2       2129     \$2.59.8       8201 AB     \$1.75.7       212 TCM     \$695 to \$79.9       9600AB     \$2.99.9       9629     \$2.650 to \$2.7       P-V.22     \$695 to \$79.9       P-201C     \$695 to \$79.9	5 5 0 5 5 5 0 0	
ntice Corp.	1800 DED \$377. 2127 \$1,69. 2129 \$2,59. 8201 A/B \$1,75 212 TCM \$9695 to \$79. 9600A/B \$2,99. 9629 \$2,650 to \$2,75 P-2/2 \$8955 to \$79. P-2/10 \$8955 to \$79. P-2/10 \$8955 to \$79.	5 5 0 5 5 5 0 0	
ntice Corp.	1800 DED   \$377.   2127   \$1,98.   2129   \$2,59.   8201 A/B   \$1,75.   8201 A/B   \$6,95.   9600A/B   \$2,29.   9629   \$2,2650 to \$2,79.   9420   \$6,95.   942	5 5 0 5 5 5 5 5 5 5 5 5 6 7 7	
ntice Cerp	1800 DED   \$377.   2127   \$1,98.   2129   \$2,59.   8201 A/B   \$1,75.   8201 A/B   \$6,95.   9600A/B   \$2,29.   9629   \$2,2650 to \$2,79.   9420   \$6,95.   942	5 5 0 5 5 5 5 5 5 5 5 5 6 7 7	
intice Corp.	1800 DED \$377. 2127 \$1,69. 2129 \$2,59. 8201 A/B \$1,75 212 TCM \$9695 to \$79. 9600A/B \$2,99. 9629 \$2,650 to \$2,75 P-201C \$6995 to \$79. P-201C \$6995 to \$79. P-202T \$2,995 to \$39. P-208A/B \$1,650 to \$1,75 \$4995 to \$79. P-212 \$4995 to \$79.	5 5 5 5 5 5 6 6 5 5 6 6 7 7 8 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9	
	1800 DED   \$377.   2127   \$1,89.   2129   \$2,59.   8201 AB   \$1,75.   8201 AB   \$1,75.   9600AB   \$2,29.   9600AB   \$2,29.   9629   \$2,650 to \$2,75.   P-V.22   \$3655 to \$79.   P-201C   \$4955 to \$79.   P-202T   \$2,950 to \$37.   P-202T   \$2,950 to \$37.   P-202T   \$4,950 to \$37.   P-212   \$4,950 to \$37.   P-212   \$4,950 to \$37.   P-212   \$4,950 to \$37.   P-213   \$3,500 to \$1,75.   P-214   \$4,950 to \$39.   P-205 to \$3.	5 5 5 5 5 5 6 6 5 5 5 5 6 6 5 5 7 7 8 7 8 8 7 8 8 7 8 8 8 8 8 8 8 8	
	1800 DED   \$37.7   \$1.89   \$2.2127   \$1.89   \$2.259   \$2.259   \$2.259   \$2.259   \$2.212   \$1.259   \$2.259   \$2.212   \$1.212   \$	5 5 5 5 5 5 6 6 6 6 7 7 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	
	1800 DED	5 5 5 5 5 5 5 5 6 0 6 5 5 5 5 6 7 7 8 7 8 7 8 7 8 7 8 7 8 7 8 7 8 8 7 8 8 7 8 8 7 8 8 7 8 7 8 8 7 8 8 7 8 8 7 8 7 8 8 7 8 1 7 8 1 7 1 7	
iseCom	1800 DED   \$377.	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
iseCom	1800 DED   \$377.	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	
satice Corp.	1800 DED	5 5 5 5 5 5 5 6 6 5 5 5 5 5 5 6 6 6 7 7 8 7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	
iseCom	1800 DED   \$377.	5 5 5 5 5 5 5 5 5 5 5 5 5 6 7 7 7 8 7 8 7 9 9 9 9 9 9 9 9 9 9 9 9 9	

	MODEL PRICE	P
illes, tes.	MPS 14.4K	
	OMNIMODE CS (CENTRAL SITE)	
	OMNIMODE 48	
	OMNIMODE 96 \$4,150 to \$5,850	
	VA103 MODEMPHONE \$250 to \$380	
	VA212 AUTO DIAL\$695	
	VA212 PAR AUTO DIAL \$695	
	VA212LC\$495	
	VA315 \$375	
	VA317	
	VAGEE 9975	
	VA355 \$375	
-	VA1205/30 SERIES	*********
	VA1240 \$290	
	VA1250 SERIES DIRECT-CONNECT	
	VA1250 SERIES OF LEASED LINE MODEMS \$425 to \$550	
	VA2430 G/K	********
	VA2440/45 \$575 to \$725	************
	VA2450 SERIES \$725 to \$875	
	VA3451 TRIPLE MODEM	
	VA3455	
	VA3467 N/A	
	VA3480 SERIES	
	VA4400 SERIES	
	VA4840 SERIES	
hustries	6385	
	6860	
inc	OEM 212A FOR CUSTOM APPLICATIONS	
	PC 212A MODEM FOR IBM PC AND PC-XT \$499	
	R14.4 MODEM	
	R103J LSI MODEM	
	R212A INTELLIGENT MODEM	
	R212A LSI MODEM	
	R2424 LSI MODEM	
	RV .29/2 MODEM SYSTEM	
	T103J LSI MODEM	
	T108 LSI DATA MODEM	
	T113C LSI DATA MODEM	
	T202S LSI DATA MODEM	
	T202T LSI DATA MODEM	
	T212A LSI DATA MODEM	
	TA 208A/B LSI MODEM	********
ell International	R24 THREE MODULE SET	
sii international	R24DC	********
	R24LL N/A	
	R48DP	
	R96DPN/A	
	R96FAX N/A	errererer.
	R96FT	
	R242M N/A	
	R1212DC	
	R1212M N/A	
	R2424DC N/A	
	R2424DC N/A V27P/1 N/A	
	R2424DC N/A V27P/1 N/A V96P/1 N/A	
Inc.	R2424DC NIA V27P/1 NIA V96P/1 NIA V303 \$250	\
Inc.	R2424DC         N/           V27P/1         N/A           V98P/1         N/A           2103         \$25           2202         \$40	\
Inc.	R2424DC         N/A           V2TP/1         N/J           V96P/1         N/J           2103         \$250           2202         \$400           24407         \$500	)
Inc.	R2424DC         N/-           VZ7P/1         N/-           V96P/1         N/-           2103         \$255           2202         \$400           2407         \$500           76-1005/1009 (ACU)         \$699 to \$844	) 
	R2424DC         N/           V27P/1         N/           V96P/1         N/           2103         \$25           2202         \$400           2407         \$50           76-1005/1009 (ACU)         \$699 to \$84           DC MODEM IB 26-1175         \$99	
Corp.	R2424DC N// V27P/1 N// V96P/1 N// V96P/1 N// 2103 \$255 2202 \$407 76-1005/1009 (ACU) \$899 to \$500 DC MODEM IB 26-1175 \$99 DC MODEM IB 26-1173 \$199	
Corp.	R2424DC N// V27P/1 N// V96P/1 N// V96P/1 N// 2103 \$255 2202 \$407 76-1005/1009 (ACU) \$899 to \$500 DC MODEM IB 26-1175 \$99 DC MODEM IB 26-1173 \$199	
Corp.	R2424DC         N/A           V27P/1         N/A           V96P/1         N/A           2103         3255           2202         \$400           2407         \$50           76-1005/1009 (ACU)         \$699 to \$50           DC MODEM IB 26-1175         \$99           DC MODEM II 26-1173         \$193           4700         \$326           TC55001         N/A	
Corp.	R2424DC         N/A           V27P/1         N/A           V96P/1         N/A           2103         3255           2202         \$400           2407         \$50           76-1005/1009 (ACU)         \$699 to \$50           DC MODEM IB 26-1175         \$99           DC MODEM II 26-1173         \$193           4700         \$326           TC55001         N/A	
Corp.  Inc.  Corporation	R2424DC         N/           V27P/1         N/A           V96P/1         N/A           2103         \$255           2202         \$400           2407         \$500           DC MODEM IB 26-1175         \$99           DC MODEM II 26-1173         \$199           4700         \$368           TCS001         N/           TELEPORT 300         \$398	
Corp.	R2424DC M/V Y27P/1 N/V Y9FP/1 N/V Y9FP/1 N/V Y9FP/1 S/V	3
Corp.  Inc.  Corporation	R2424DC         N/           V27P/1         N/           V27P/1         N/           V27P/1         N/           V28P/1         N/           2103         \$255           2202         \$400           2407         \$50           DC MODEM IB 26-1175         \$99           DC MODEM II 26-1173         \$19           4700         \$360           TC5001         N/           TELEPORT 300         \$398           202 C/D         \$322           AIM SERIES         \$1,061 to \$2,22	1
Corp.  Inc.  Corporation	R2424DC M/V Y2TP/1 N/V Y2FP/1 N/V Y9FP/1 N/V Y9FP/1 N/V Y9FP/1 S/V Y9FP/1 S/V Y9FP/1 N/V	3
Corp.  Inc.  Corporation	R2424DC         M/           V27P/1         N/           V96P/1         N/           V103         \$255           2202         \$400           2407         \$500           76-1005/1009 (ACU)         \$699 to \$500           DC MODEM IB 26-1175         \$9           DC MODEM II 26-1173         \$19           4700         \$368           TC5001         N/           TELEPORT 300         \$358           202 C/D         \$255           AIM SERIES         \$1,060 to \$2,62           R103         \$113           R103 C/D         \$255 to \$338	3 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
Corp.  Inc.  Corporation	R2424DC         M/           V27P/1         N/           V96P/1         M/           V96P/1         M/           2103         \$255           2202         \$407           2407         \$509           DC MODEM IB 26-117S         \$699 to \$64           DC MODEM II 26-117S         \$190           DC MODEM II 26-117S         \$360           TC5001         N/           V202 C/D         \$322           Alm SERIES         \$1,060 to \$2,22           R103         \$217           R103 C/D         \$255 to \$33           R202 C/D         \$350	3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3
om, inc.  • Corporation  • X, inc.	R2424DC         N/A           V27P/1         N/A           V96P/1         N/A           V103         3255           2202         \$400           2407         \$599 \$500           76-1005/1009 (ACU)         \$699 to \$500           DC MODEM IB 26-1175         \$99           DC MODEM II 26-1173         \$199           4700         \$366           TC5001         N/A           TC5001         \$369           TC5001         \$370           TELEPORT 300         \$399           202 C/D         \$350           R103 C/D         \$255 to \$32           R103 C/D         \$255 to \$32           R202 C/D         \$350           V.29 PLUS         \$4 100 to \$4,600	555555555555555555555555555555555555555
Corp.  Inc.  Corporation	R2424DC M/V Y2TP/1 N/V Y9FP/1 N/V	555555555555555555555555555555555555555
Corp.  Inc.  Corporation  ex, inc.	R2424DC         N/A           V27P/1         N/A           V96P/1         N/A           2103         \$255           2202         \$400           2407         \$500           76-1005/1009 (ACU)         \$699 to \$500           DC MODEM IB 26-1175         \$99           DC MODEM IZ 6-1173         \$199           4700         \$360           7500         \$300           7500         \$300           7620	555555555555555555555555555555555555555
om, inc.  • Corporation  • X, inc.	R2424DC M/V Y2TP/1 N/V Y9FP/1 N/V	555555555555555555555555555555555555555
Corp.  Inc.  Corporation  ex, inc.	R2424DC M/V Y27P/1 N/V Y9FP/1 N/V Y9FP/1 N/V Y9FP/1 N/V Y9FP/1 N/V Y9FP/1 N/V 2103 S256 Z202 \$407 \$500 Z202 \$407 Z502 \$407 Z502 \$400 Z50	3
Corp.  Inc.  Corporation  ex, inc.	R2424DC M/V Y2TP/1 N/V Y9FP/1 N/V	
corp	R2424DC M/V V27P/1 M/V V9FP/1 M/V V9FP/1 M/V V9FP/1 M/V V9FP/1 M/V 2103 S256 Z202 \$407 \$500 Z407 \$500 DC MODEM IB 26-1175 \$90 DC MODEM IB 26-1173 \$90 DC MODEM IB 26-1173 \$90 DC MODEM IB 26-1173 \$90 Z0C /O \$300	
Corp.  Inc.  Corporation  ex, inc.	R2424DC M/V Y2TP/1 N/V Y9FP/1 N/V	

OOR	MODEL	PRICE		PAG
Data Products	212	\$250		. A-6
Electronics, Inc.	MODEC 1540			A-6
	MODEL 1653			A-6
share, Inc.	MODEL 912 MODEM	\$695		A-6
ersal Data Systems, Inc.	103 LP O/A			
Comment of the commen	103.J			
	103JLP			
	108			
	2018	. \$965		A-6
	2010	. \$775		
	202LP	\$195		A-6
	2028			
	202S/SS			
	202SLP			
	202T			
	208A/B			. A-
	212A			. A-
		\$645		. A-
	212LP			
	9600			. A-
	9600A/B			. A-
. Robotics, Inc	IBM PC MODEM	\$445	9	. A-
	IBM PC 64	\$599		. A-
	IBM PC MODEM 256	. \$1,145		. A-
	OEM 4	\$300	)	. A-
	PASSWORD	\$448	8	. A-
	S100 BUS MODEM	\$445	9	A-
Tel. Inc.	212 SERIES		5	A-
	1200 - PLUS			
	MD 103-1/2E			
	MD 103J SERIES			
	MD 113 SERIES \$24			. A-
	MD 201-1			A-
	MD 201-3/4E			A-
	MD 202-1/2E			
	MD 202-1/2E			
	PCM-H150P			
	PCM-H130P			
anne Mantanto de la				
onary Electronics, Inc.	. VISIONARY 100			. A-
	VISIONARY 1200			. A-
ng Laboratories, Inc	. CATV MODEM			. A-
	WA 3451 MODEM			
stern Datacom	. 212 AUTODIAL			. A.
	WORLDCOM 200			
fdata inc	. WD-212A			
m Telephonics,inc	. NETWORKER	\$12	9	A-

## Modem Eliminators

VENDOR	MODEL	PRICE	PAGE
Ark Electronic Products, Inc.	MODEM ELIMINATOR MODEL 3 (ME-3)	\$295	. A-12
Astrocom Corp.	MODEM EMULATOR		
Avanti Communications Corporation	300	\$360	. A-14
	300H	\$795	. A-14
Com Data	ME-2D		. A-21
Com/Tech Systems, Inc.	MODEMULATOR 402A		. A-23
	ME-1	\$440	. A-26
Gandaif Data Inc.	ME 2D		. A-29
	ME 922		A-29
General Datacomm Industries, Inc	DME-3		. A-32
Inter-Link	CLUSTER MODEM EMULATORS CME-1R	\$875	A-36
International Data Sciences, Inc.	MODEL 6110	\$370	A-37
Kaufman Research Mfg., Inc.			A-37
	DATA COMMUNICATION MODULE (TYPE 8610)		
	TP-232		

## Radio Frequency Modems

VENDOR	MODEL	PRICE PAGE	
Applitek Corp.	BROAD BAND MODEM	NA A-12	
Gandalf Data Inc.	RADIO MODEM	\$1.595 A-29	,

VENDOR	MODEL PRICE	PA	AGE
Glenayre Electronics	GL 1102 HF PULSE COMPRESSION		
	GL 1142 HFMESSAGE TERMINAL		
Interactive Systems/3M	MODEL 520 AUDIO MODEM	A	1-35
	MODEL 720 DATA & CONTROL MODEM	) A	1-35
	MODEL 920 DATA MODEM	) A	1-35
	MODEL 925 DATA MODEM		
	MODEL 960 DATA MODEM		
	MODEL 965 DATA MODEM		
Ungermann-Bass, Inc.	CATV-MODEM \$750 to \$950		
	NETWORK MODEM 640\$895		
	NETWORK MODEM 670\$1,980		

## Short-Haul Modems

DOR	MODEL	PRICE	PAGE
dahl Corporation	982 LIMITED DISTANCE DATA SET	\$495 to \$850	A-11
	984 MULTIPORT LIMITED DISTANCE DAT		A-11
Electronic Products, Inc	LIMITED DISTANCE MODEM MODEL 18		A-12
Electronic Products; mos	LIMITED DISTANCE MODEM MODEL 4 (L		A-12
	LIMITED DISTANCE MODEM MODEL 5 (L		A-12
	LIMITED DISTANCE MODEM MODEL 5 (L		
			A-14
recom Cerp			A-14
			A-14
	SH96/48		A-14
	SH192S		A-1
enti Communications Corporation .		\$575	A-1
	1935	\$695	A-10
	1949		A-1
	2200	\$950	A-1
	2300H		A-1
	2300M		A-1
			A-1
			A-1
	MODEL 600A		A-1
M 0			
Iden Corp	BIT-DRIVER 222-024		A-1
	BIT DRIVER 222-025		A-1
biebus Systems Corp			A-1
dex Corp			A-1
	8250 LDSU	N/A .	A-1
herent Communications Systems C	DFD LINEMATE 192		A-1
mmodore Business Machines, Inc.	C-1600	N/A .	A-2
mmunication Research Corp		\$315 .	A-2
			A-2
mplex Systems.inc.			A-2
uthay alamaino	LVS 76.8		A-2
mtech Data Corp.		\$2,000	A-2
ta Control Systems			A-2
	SR102		A-2
	SR120		A-2
	SR202		A-2
taproducts Corporation	DDU-1	\$700 .	A-2
tatel,inc.	DCP 3000	\$200 .	A-2
	DCP 3010	\$260 .	A-2
	DCP 3020		A-2
			A-2
		\$550	A-2
	DCP 3070		A-2
	DCP 3150		A-2
	DCP 3155		A-2
II-Teleproducts,inc		\$689 .	A-2
	ASR-3		A-2
	ELD-1	\$175 .	A-2
racom Corp	ECS-10	\$99 to \$104 .	A-2
matech Corporation	LDM 12	\$275	A-2
	LDM 22		A-2
andalf Data Inc.	LDS 120; RM 3120		A-2
Income spaces spaces			
	LDS 140; RM 3140		A-2
		\$786 to \$886 .	A-2
	LDS 309; RM 3309		A-2
	LDS 319; RM 3119		

PRICE PAGE	MODEL	VENDOR
\$450 A-29	LDS 329; RM 3329	Gandalf Data Inc.
\$295 A-29	SM LDS 349:	
\$295 to \$305 A-29	LINE MISER	
N/A A-30	MINI LDS 122	
\$660 A-32	DC 2020	General Datacomm Industries, Inc
\$805 A-32	DC 2030	•
\$295 to \$325 A-32	GDC LCM 1010/1020	
	NMS-2020	
\$235 A-36	100 RA	Interbusiness Corp.
\$495 A-36	200	
\$245 A-36	LDM-1R	Inter-LinK
\$600 A-36	LDM-1V	
\$750 A-37	MODEL 6000H	International Data Sciences, Inc.
\$750 A-97	MODEL 6000L	
	MODEL 6200	
	MODEL 6220	
	MODEL 6240	
	DT 19.2 DATA TRANCEIVER	Kanusi Laboratories
	4 WIRE BASE BAND	Kinex Corn.
	2400/201C	Killes Sorpi
	29600	Madzar Corp.
	M401	Micom Systems, Inc.
	M402	micom ayatamaj mo
	M421	
		Microcom Inc.
	minima i minima i man i man i minima i	microcom Inc
	ERA 2 FOR IBM PC JR	
	PCS FLASH 2000 NETWORKING MODEM	
\$895 A-42		
	CATV MODEM	Multi Trenics
	EXT-1212	PEGA, Inc.
	8192	Penril Corp.
	PSH-96A	
\$920 to \$945 A-50		Racal-Milgo, Inc.
	LDM 710 LIMITED DISTANCE DATA MODEM	Rixon, Inc.
	LDM 720 LIMITED DISTANCE DATA MODEM	
	6402	Scientific Atlanta, Inc
	5010 SERIES OPTICAL DATA LINK	Scientific Radiation
\$500 A-54	IDBC 9600 SERIES	Seiscorp, Inc.
NA A-55	71	Telebyte Technologies, Inc
	72	
N/A A-58	73 REMOTELY CONTROLLED SHM	
	75 DUAL SHORT HAUL MODEM	
	SLDM	Timeolex, inc.

## Other Modem Types

VENDOR	MODEL	PRICE	PA	\GE
Anderson Jacobson, Inc.	AJ 1212-AD1	\$595	A	-11
	AJ 1212-AD2	\$695	A	-12
	AJ 1212-2BO1	\$425 to \$495	A	1-12
	AJ 1212-ID01	\$465	A	1-12
	AJ 1212-ISO1	\$385	A	-12
	AJ 1212-RM1	\$595	A	1-12
	AJ 1212-ST	\$495	A	-12
	AJ 1259	****		-12
	AJ 1259-AD	\$775		-12
Bo-Sherrel Co., Inc.	M-1A		A	-16
	M-3			-16
	M-4			-16
Gandalf Data Inc.	LDM 404: RM 3404			1-30
	LDM 409			-30
	LDM 414: RM 3414			1-30
	LDM 444: RM 3444			1-36
	LDM 454; RM 3454			1-30
General Datacomm Industries, Inc.	CSU-550A			1-36
LED Systems.inc.	4D1			1-38
	4DT1/7DT1			1-36
Penril Corp	8801C			1-41
	MCU 4B			1-4
Telegrocessing Products, Inc.		\$415 to \$540		1-56
		\$625 to \$630		4-56
Tellahs, Inc.		\$450 to \$500		4-56

AMDAHL CORP.

983 DSU
Modern Class: Digital (DSU)
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
2,400 bos. 4,800 bos. 9,800 bos.

56,000 bps Interface: RS-232C, CCITT V.24,

V.35
Transmission Medium: DDS
Diagnostics: Yes; bull-in
Features: Autocqualizer,
Diagnostics, Switchable Data Rates
Distribution Method: End user
Price: 3645 to 5745
Number Installed: July 1983
(See Vendor Profile Page V-2)

AMDANL CORP.
982 LIMITED-DISTANCE DATA SET
Modem Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 50,000 bps, 10,000 bps, 1

64,000 bps; Asynchronous - 64,000 bps Interface: RS-232C, CCITT V.24, MIL 188C, V.35, Bell 301/303 Transmission Medium: Metallic 4-

Wire Diagnostics: Yes; Bullt-in Features: Autoequalizer, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$495 to \$850 Number Installed to Date: 1,000 - 5,000

Date First Installed: July 1982

984 MULTIPORT LIMITED-DISTANCE DATA SET Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1,800 bps; Synchronous - 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Metallic 4-Wire Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Multiport, Switchable Data Dates Distribution Method: End user

AMERICAN PHOTONICS 7R2000

Modern Class: Fiber Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rabe: Asynchronous-110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 1,200 bps, 56,000 bps 1,400 bps, 14,400 bps, 19,200 bps, 56,000 bps Interface: RS-232C Transmission Medium: Fiber Optics Distribution Method: OEM Price: \$99 Number Installed to Date: Under 500 (See Vendor Profile Page V-2)

ANCHOR AUTOMATION, INC. MARK II SIGNALMAN Modern Class: Long-Haui Transmission Technique: Asynchronous

Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade

Diagnostics: No Features: Alternate Voice/Data, Originate/Answer Distribution Method: OEM, Thirdparty

Lines

Price: \$99 Number installed to Date: 10,000 -50,000 Date First Installed: January 1982 (See Vendor Profile Page V-2)

ANCHOR AUTOMATION, INC. MARK VI SIGNALMAN Modern Class: Long-Haul Transmission Technique: Asynchronous

Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Interface: IBM Bus
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines

Diagnostics: No Feetures: Autodial, Autoanswer, Alternate Voice/Data Distribution Method: OEM, Thirdparty

Price: \$239 Number installed to Date: 1,000 -5,000 Date First Installed: January 1983

ANCHOR AUTOMATION, INC. MARK VII SIGNALMAN Modem Class: Long-Haul Transmission Technique: Asynchronous

Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade

Lines
Features: Autodial, Autoanswer,
Alternate Voice/Data
Distribution Method: OEM, Third-

Price: \$159 Number installed to Date: 10,000 -50,000 Date First Installed: June 1982

ANCHOR AUTOMATION, INC. MARK X SIGNALMAN Modem Cless: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex,

Full-Duplex Transmission Rate: Asynchronous -300 bps

Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswor, Alternate Voice/Data Distribution Method: OEM, Third-

Distribution Method: OEM, Thirdparty Price: \$189 Number installed to Date: 500 -

1,000 Date First installed: November 1983

ANCHOR AUTOMATYON, INC.
MARK XII SIGNALMAN
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 300 bps, 1,200 bps
interface: RS-232C
Belf-Compatible: 103, 212
Transmission Medium: Voloe-Grade
Lines

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Switchable Data Rates Distribution Method: OEM, Thirdparty

Price: \$399
Date First installed: September

ANCHOR AUTOMATION, INC.
VOLKSMODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Hall-Dupiex,
Full-Dupiex
Transmission Mate: Asynchronous
300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade

Lines
Diagnostics: No
Features: Originate/Answer
Diatribution Method: OEM, Thirdparty
Price: \$79
Number installed to Date: 5,000 10,000

Date First Installed: September 1983 AMDERSON JACOBSON, INC. AJ 2424

Modem Cleas: Coupler Trensmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No

Distribution Method: End user, OEM, Third-party Number installed to Date: 10,000 -50,000 Date First Installed: 1977 (See Vendor Profile Page V-2) ANDERSON JACOBSON, INC.

AJ 247
Modern Clases: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Distribution Method: End user,

Third-party Number installed to Date: 5,000 -10,000

Date First Installed: 1978

ANDERSON JACOBSON, INC.
AJ 1232
Modern Class: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps, 1,200 bps
Interface: R5-232C
Bell-Competible: 103, 212
Transmission Medium: Voice-Gräde
Lines
Diagnostics: No

Diagnostics: No Features: Autoanswer, Switchable Data Rates Distribution Method: End user, OEM, Third-party Price: \$635

Number Installed to Date: 1,000 - 5,000

Date First Installed: 1981

ANDERSON JACOBSON, INC. AJ 4048
Modem Clasa: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Moder Ful-Duplox Transmission Rete: Asynchronous/Synchronous-2.400 bps, 4.800 bps interface: R5-232c, MIL 1802.
Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autocquaitzer, Autoanswer, Afternate Voice/Data, Diagnostics, Fallback, Switchable Data Rates, Autoecho Cancel Distribution Method: End user, Third-party Price: \$2,495 to \$2,990

Number installed to Date: 100 - 500 Date First Installed: May 1983 ANDERSON JACOBSON, INC.

ANDERSON JACOBSON, INC.
AJ 1212-ADI
Modern Class: DDD
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Medium: Voicin-Grade
Lines
Diagnosetics: Yes; Built-in
Features: Autodial, Autoequalizer,

Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user, OEM, Third-party Brine: \$595 Date First Installed: December 1983

ANDERSON JACOBSON, INC. A.I.1212-AD2 Modern Class: DDD Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Competible: 103, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Feetures: Autodial Autoequalizer. Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user. OEM, Third-party

ANDERSON JACOBSON, INC. AJ 1212-2BO1 Modern Class: DDD Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, IBM/PC BUS Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

**Date First Installed: December 1983** 

Price: \$695

Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Diagnostics Distribution Method: End user. OEM, Third-party Price: \$425 to \$495

ANDERSON JACOBSON, INC. AJ 1212-ID01

Modern Class: DDD Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos: Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, TTL Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Festures: Autodial, Autoequalizer Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OFM. Thirdparty Price: \$465 Date First Installed: December 1983

ANDERSON JACOBSON, INC. AJ 1212-ISO1

Modern Class: DDD Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, TTI

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Switchable Data Rates, Integral Card Distribution Method: OEM, Third-Price: \$385

ANDERSON JACOBSON, INC.

Modem Class: DDD Transmission Techn Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos: Asynchronous/ Synchronous - 1,200 bps rface: RS-232C Beil-Competible: 103, 212
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Add-on Features: Autoanswer, Diagnostics Distribution Method: End user. OEM, Third-party

ANDERSON JACOBSON, INC. AJ 1212-ST Modern Class: DDD

Transmission Technique:

Asynchronous, Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: BS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates ribution Method: End user. OEM, Third-party Price: \$495

**Date First installed: December 1983** ANDERSON JACOBSON, INC.

Modem Class: DDD

Transmission Technique:

Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoanswer, Diagnostics, Switchable Data Rates, Triple Modern Distribution Method: End user, OEM, Third-party Price: \$695 Number Installed to Date: 5,000 -

ANDERSON JACOBSON, INC. AJ 1259-AD Modem Class: DDD Transmission Technique:

Date First Installed: 1981

Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade

Diagnostics: No Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates, Triple Modem Distribution Method: End user, OEM, Third-party Price: \$775 Number installed to Date: 1,000 -5.000 Date First Installed: 1982

APPLITEK CORP. BROAD BAND MODEM Modern Class: Radio Frequency

ission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 10M bps Transmission Medium: Wide-Band Lines, Fiber Optics Diagnostics: No Features: Frequency Select Distribution Method: OEM Number Installed to Date: 0 - 100 Date First Installed: October 1983 (See Vendor Profile Page V-2)

DUCTS, IN LIMITED DISTANCE MODEM MODEL 8 (LDM-6) Modem Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 14,400 bps, 19,200 bps, 56,000 bps; Synchronous 9,600 bps Interface: RS-232C

Lines Diagnostics: No Features: Diagnostics, Switchable Data Rates Distribution Method: End user, OEM Price: \$195 Number Installed to Date: 500 -

1 000 Date First Installed: 1981 (See Vendor Profile Page V-3)

ARK ELECTRONIC PRODUCTS, INC. MODEM ELIMINATOR MODEL 3 (ME-3) Modern Class: Modern Eliminator Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 bps Interface: RS-232C

Features: Diagnostics, Switchable

Data Rates Distribution Method: End user, OEM Price: \$295 Number Installed to Date: 1,000 -5,000 Date First Installed: 1979

ARK ELECTRONIC PRODUCTS, INC. LIMITED DISTANCE MODEM MODEL 1B (LDM-1B) Modern Class: Short-Haul Transmission Technique: Synchronous Trensmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 bps; Asynchronous/Synchronous - 3,600 bps, 7,200 bps Interface: RS-232C Diagnostics: No Features: Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$693 ber installed to Date: 500 -1.000 **Date First Installed: 1978** 

ARK ELECTRONIC PRODUCTS, INC. MODEL 4 (LDM-4) Modem Class: Short-Haul Transmission Technique Asynchronous Transmission Mode: Half-Duplex. Full-Duplex sion Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 Interface: RS-232C Transmission Medium: Wide-Band

Features: Diagnostics, Switchable Data Rates Distribution Method: End user, OEM Number Installed to Date: 500 -1.000 Date First installed: 1980

ARK ELECTRONIC PRODUCTS, INC. LIMITED DISTANCE MODEM MODEL 5 (LDM-5) Modern Class: Short-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,800 bps, 14,400 bps, 19,200 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bos Interface: RS-232C Features: Diagnostics, Switchable Data Rates Distribution Method: End user, OEM Price: \$395

Number installed to Date: 500 -

1.000

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ARK ELECTRONIC PRODUCTS, INC. MODEL 7 (LDM-7) Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 bos: Asynchronous/ Synchronous - 57,600 bps Interface: RS-232C Transmission Medium: Wide-Band Lines Diagnostics: No Features: Diagnostics, Switchable Data Rates Distribution Method: End user, OEM Price: \$425 Number Installed to Date: 100 - 500 Date First Installed: 1982

MODEM EMULATOR
Modem Class: Modem Eliminator
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous 2,400 bps, 4,800 bps, 9,600 bps,
14,400 bps, 19,200 bps, 56,000 bps
Interface: RS-232C
Distribution Method: Third-party
Price: \$315
Number Installed to Date: 5,000 10,000
Date First Installed: January 1976
(See Vendor Profile Page V-3)

ASTROCOM CORP.

ASTROCOM CORP. MO512 Modern Class: Short-Haul **Transmission Technique:** Synchronous sion Mode: Half-Duplex, Full-Duplex ission Rate: Synchronous -Trens 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps Interface: RS-232C Transmission Medium: Uniond Twisted-Wire Diagnostics: Yes; Built-in Features: Diagnostics, Multiport, Switchable Data Rates Distribution Method: Third-party Price: \$610 Number Installed to Date: 5,000 -10,000 Date First installed: January 1977

ASTROCOM CORP.
\$14565
Modern Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous56,000 bps, Asynchronous/
Synchronous - 28,000 bps
Invertece: 82-322C, CCITT V.35

Transmission Medium: Unload Twisted-Wire Diagnostics: Yes; Built-in Features: Diagnostics, Multiport, Switchable Data Rates Distribution Method: Third-party Price: \$825

ASTROCOM CORP. SH96/48 Modern Class: Short-Haul Transmission Technique: Asynchronous namission Mode: Half-Duplex. Tre **Full-Dunley** Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C Transmission Medium: Uniced Twisted-Wire Diagnostics: Yes; Built-in Features: Diagnostics, Multiport Distribution Method: Third-party Price: \$295

Number Installed to Date: 5,000 -10,000 Date First Installed: January 1977

ASTROCOM CORP. SH192S Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interfece: RS-232C Transmission Medi ım: Unload Twisted-Wire Features: Multiport, Switchable Data Sales Distribution Method: Third-party

Number installed to Date: 100 - 500

Date First Installed: January 1982

Price: \$395

ATARI 1030 DIRECT CONNECT
MOODEM
Modern Class: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-2320
Belf-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-In
Features: Autodial, Multipor
Distribution Method: Third-party
(See Vendor Profile Page V-3)

AVANTI COMMUNICATIONS CORP. 300

300
Modem Class: Modern Eliminator
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous/
Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps
Interface: RS-232C, CCITT V.24
Transmission Medium: Voice-Grade
Lines

Features: Switchable Data Rates Distribution Method: End user, OEM, Third-party Prices 3580 Number Installed to Date: 500 - 1,000 Date First Installed: September 1977 (See Vendor Profile Page V-3) AVANTI COMMUNICATIONE CORP. 300H

CORP.
300H
Modem Class: Modern Eliminator
Transmission Technique:
Synchronous
Transmission Mede: Half-Duplex,
Full-Duplex
Transmission Mede: Half-Duplex,
Full-Duplex
Transmission Mede: Half-Duplex,
Full-Duplex
Transmission Mede: Workpronous
56,000 bps: Asynchronous
56,000 bps: Asynchronous
59,nchronous - 224,000 bps
Interface: V 35
Transmission Medium: Voice-Grade
Lines
Disposition: No
Feetures: Switchable Data Rates
Distribution Method: End user,
OEM, Third-party
Price: \$795
Number Installed to Date: 100 - 500
Date First Installed: Spotember

AVANTI COMMUNICATIONS CORP. 1900

m Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex
Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bos Interface: RS-232C Transmission Medium: Voice-Grade Features: Autoequalizer, Diagnostics, Switchable Data Rates. Loop Timing ribution Method: End user, OEM. Third-party Price: \$575 Number installed to Date: 500 -1.000 Date First Installed: 1982

AVANTI COMMUNICATIONS CORP.

1935 Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex Full-Duplex, Simplex Transmission Rate: Synchronous -56,000 bps; Asynchronous/ Synchronous - 64,000 bps Interface: V.35 Transmission Medium: Digital Links Diagnostics: Yes; Built-in Features: Autoequalizer, Loop Timing Distribution Method: End user, OEM, Third-party Price: \$695 Number Installed to Date: 100 - 500 Date First Installed: 1982

CORP. Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex ission Rate: Synchronous -56,000 bps; Asynchronous/ Synchronous - 64,000 bps Interface: RS-449 Transmission Medium: Digital Links Features: Autoequalizer, Diagnostics, Loop Timing Distribution Method: End user, OEM, Third-party Price: \$695 Number Installed to Date: 100 - 500 Date First Installed: 1982

**AVANTI COMMUNICATIONS** 

AVANTI COMMUNICATIONS
CORP.
2200
Modern Class: Short-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Moder Half-Duplex,
Full-Duplex, Simplex
Transmission Rate: Asynchronous/
Synchronous - 1,200 bps, 1,800 bps,
2,400 bps, 4,800 bps, 9,600 bps,
14,400 bps, 64,000 bps;
5ynchronous 19,200 bps, 56,000

Synchronous 19,200 bps, 56,000 bps loss loss linterface: RS-232C, RS-449, CCITY V.24, V.35, MIL.188-114 Transmission Medium: Digital Links Diagnostics: Yes; Built-In Features: Autoequalizer, Diagnostics, Switchalzer Rates, Multidropping and Extention of DDS Circuit Diatribution Method: End user, OEM, Third-party Price: \$950 Number Installed: 1977 bate First Installed: 1977

AVANTI COMMUNICATIONS CORP. 2300H

2300H
Modern Class: Short-Haul
Transmission Technique:
Synchronous
Synchronous
Transmission Moder Half-Duplex,
Full-Duplex, Simplex
Transmission Rate: Asynchronous/
Synchronous - 2.5M bps
Interface: RS-449, RS-422, V.35,
Mill. 186/114
Transmission Medium: Digital Links
Diagnostics: PS-5 Built-in
Features: Autooqualizor,
Diagnostics, DSX-1 Compatible
Distribution Methods: End user,
OEM, Third-party
Price: \$1,975
Number Installed: 1977
Number Installed: 1977

AVANTI COMMUNICATIONS CORP. 2300M Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -56000 bps: Asynchronous/ Synchronous - 460,000 bps interface: R5-422, V.35, Bell 301/303 Transmission Medium: Digital Linka Diagnostics: Yes; Built-in Feetures: Autooqualizer, Diagnostics, Switchable Data Rates, Loop Timing Distribution Method: End user, OEM, Third-party Price: \$1,325 Number Installed: 1977

#### AVANTI COMMUNICATIONS CORP.

2400
Modem Class: Short-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Full-Duplex,
Transmission Rate: Asynchronous/
Synchronous - 2,400 bps
Interface: RS-232C
Interface: RS-232C
Diagnostics: Yes; Built-In
Features: Diagnostics, Multiport,
Dual Channel Format
Distribution Method: End user
Price: \$1,100
Number Installed: 1982.

#### AVANTI COMMUNICATIONS CORP.

Modern Class: Short-Haul Transmisaion Technique: Asynchronous, Synchronous Transmisaion Moder: Half-Dupiex, Full-Dupiex, Transmisaion Rate: Asynchronous/ Synchronous: -4,800 bps Interface: RS-232C, CCITT V.24 Transmisaion Medium: Voice-Grade Lines Diegnostics: Yes; Built-In

Diagnostics: Yes; Built-in Features: Diagnostics, Multiport Distribution Method: End user Price: \$1,950 Number Installed to Date: 100 - 500 Date First Installed: 1982

#### AVANTI COMMUNICATIONS

MODEL SOOA Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -9,600 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines, Digital Links Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Switchable Data Rates OEM, Third-party Price: \$285 Number Installed to Date: 500 -1.000

**Date First Installed: 1979** 

AVCOM, INC. CS 30A Modern Class: Direct Dial Transmission Technique: Asynchronous Transmission Mode: Full-Du

Asyltations Transmission Mode: Full-Duplex Transmission Rate: Asynchronous - 300 bps interface: TTL Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diegnostica: No

Features: Autodial, Autoenswer, Switchable Data Rates Distribution Method: OEM Price: \$109 Number Installed to Date: Under 100 Date First Installed: December 1982 (See Vendor Profile Page V-3)

(See Vendor Profile Page AVCOM, INC. PM 300

Modem Class: Direct Dial Transmission Technique: Asynchronou Mode: Full-Duplex Transmission Mode: Full-Duplex Transmission Mete: Asynchronous-300 bps Bell-Compatible: 103 Transmission Medium: Voice-Grade

Lines
Diagnostics: No
Features: Autodial, Autoanswer,
Fallback, Switchable Data Rates
Distribution Method: End user
Price: \$189

Number Installed to Date: Under 100 Date First Installed: August 1983

BACKUS DATA SYSTEMS AC 312 1200B

Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1,200 bps

Interface: RS-232C, 20 MA Current Loop Bell-Compatible: 202 Transmission Medium: Voice-Grade

Lines Features: Reverse Channel, Diagnostics

Distribution Method: End user, OEM Price: \$495 Number Installed to Date: 5,000 -10,000 Date First Installed: 1976

(See Vendor Profile Page V-3)

AC 312 300B Modern Class: Coupler

Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps interface: RS-232C, 20 MA Current

Loop
Bell-Comnatible: 103
Transmission Medium: Voice-Grade

Diagnostics: No Features: Reverse Channel, Diagnostics Diagnostics Diagnostics S199 Number Installed to Date: 5,000 -10,000 Date First Installed: 1976

BELDEN CORP.
BIT-DRIVER 22-005
Modern Class: Fiber-Optic
Transmission Technique:
Asynchronous
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous
Transmission Bobs. 800 bps. 1,200
bps. 1,800 bps. 804 bps. 1,200
bps. 3,600 bps. 14,400 bps. 1,920
bps. 5,6000 bps
interface: RS-232C

Transmission Medium: Fiber Optics Distribution Method: Third-party Price: \$195 Number Installed to Date: Under

Date First Installed: June 1982 (See Vendor Profile Page V-4)

BELDEN CORP. BIT-DRIVER 222-004 Modern Class: Fiber-Optic Transmission Technique: Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Synchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps interface: RS-232C

Transmission Medium: Fiber Optics Diagnostics: No Features: Loopback Distribution Method: Third-party

Price: \$225 Number installed to Date: 100 - 500 Date First Installed: June 1982

BELLER COMP.

BIT-ORIVER 222-024
Modem Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Rate: Synchronous
Dept. 1,800 bps, 1,800 bps, 1,900 bps, 1,900 bps

Bit Division Transmission Transmission
Transmission Transmission
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Tr

Interface: RS-232C Transmission Medium: BAL 2 Metallic Pairs Diagnostics: No

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## **ANCHOR PAD**

ANCHOR PAD INTERNATIONAL, INC. 3224 Thatcher Avenue, Marina Del Rey, California 90291 Features: Diagnostics, Loopback Distribution Method: Third-party Price: \$195 Number Installed to Date: Under 100 Date First Installed: June 1982

BELDEN CORP. **BIT DRIVER 222-025** Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps Interface: RS-232C Transmission Medium: BAL 2 Metallic Pairs Diagnostics: No Distribution Method: Third-party Price: \$170 Number Installed to Date: 100 - 500 Date First Installed: June 1982

BIZCOMP **MODEL 1012** Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-23C Bell-Competible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autodial. Autoenswer. Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user. Third-party Price: \$649 Date First Installed: January 1982 (See Vendor Profile Page V-4)

MODEL 1002 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer. Reverse Channel, Diagnostics, Distribution Method: End user. Third-party Price: \$249 Date First Installed: January 1980

BIZCOBEP
MICIDEL 1080
Miciden Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 110 bps. 300 bps
Interface: 182-232C

Lines
Distribution Method: End user,
Third-perly
Price: \$139
Date First Installed: January 1980
BEZCOMP
MODEL \$120
Modem Class: Long-Haul
Transmission Technique:

Transmission Medium: Voice-Grade

Bell-Compatible: 103

Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 110 bps, 300 bps, 1,200 bps
Interface: Full 1
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autodial, Autoanswer,
Atternate Voice/Data, Reverse
Channel, Diagnostics, Fallback,
Switchable Data Flates
Distribution Method: End user,

Number Installed to Date: 500 - 1,000
Date First Installed: June 1983
BLACK BOX
CATALOG/EXPANDOR, INC.
BELL-COMPATIBLE MODEM 212

Price: \$499

Modem Class: Line Driver Transmission Technique: Asynchronous, Synchronous Asynchronous, Synchronous 100 bps, 1,200 b

BO-SHERREL CO., INC. M-1A Modern Clase: LTD Distance Transmission Technique: Asynchronous Transmission Mode: Half-Duolex

Date First Installed: July 1983

(See Vendor Profile Page V-4)

Transmission advice: nair-Jupes, Transmission Rate. Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 2,400 bps, 4,800 bps, 9,600 bps, 2,400 bps, 4,800 blass, 9,600 bps, 2,400 bps, 1,000 blass, 1,000 bps, 1,000 bps, 1,000 blass, 1,000 bps, 1,000 bps, 1,000 blass, 1,000 bps, 1,000 blass, 1,000 bps, 1,000

BO-SHERREL CO., INC. M-3 Modern Class: LTD Distance Transmission Technique: Asynchronous

(See Vendor Profile Page V-4)

Transmission Mode: Half-Duplex, Full-Duplex, Simplex Full-Duplex, Simplex Transmission Rate: Asynchronous 110 bps, 300 bps, 900 bps, 1,200 bps, 1,800 bps, 1,800 bps, 1,800 bps, 1,800 bps, 1,800 bps interface: RS-232C Transmission Medium: Narrow-Band Lines Diagnostics: No Distribution Method: End user Price: \$49 Number Installed to Date: 500 - 1,000 bate First Installed: 1978

BO-SHERREL CO., INC.

Modem Class: Limited Distance Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24. CCITT V 26 Transmission Medium: Narrow-Band Lines Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$440 per installed to Date: 1,000 -5.000 Date First Installed: 1980

BROADBAND SYSTEMS, INC.
BIT DRIVER 222004
Modern Class: Floer-Optic
Transmission Technique:
Synchronous
Transmission Retis: Synchronous
110 bps. 56,000 bps
Interface: RS-232C
Transmission Medium: Fiber Optics
Diagnostics: No
Features: Clock Calendar
Distribution Method: Third-party
Price: \$225
Number Installed: April 1981
,000
Date First Installed: April 1981
/68e Vendor Profile Page V-4)

BROADBAND SYSTEMS, INC. BIT DRIVER 222005 Modem Class: Fiber-Optic Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 56,000 bps Interface: RS-232C Transmission Medium: Fiber Optics Features: Diagnostics, Clock Calendar, Loopback Distribution Method: Third-party Price: \$195 Number Installed to Date: 500 -Date First Installed: April 1981

EURROUGHS CORP. CP 1004 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Full-Duplex, Full-Duplex, Full-Duplex, Transmission Rate: Synchronous - 2,400 bps. 4,800 bps interface: RS-232C, CCITT V.24 Features: Autoequalizer, Dagnostics, Fallback Date First Installed: 1982 (See Vendor Profile Page V-4)

BURROUGHS CORP.
CP 1009
Modem Clase: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 4,800 bps, 9,600 bps;
Asynchronous/Synchronous - 7,200
bps
Interface: RS-232C, CCITT V.24
Features: Autocqualizer,
Diagnostics, Faliback
Date First Installack

BURROUGHS CORP.
CP 1009-R/T
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous-4,800 bps, 9,800 bps,
Asynchronous/Synchronous-7,200 bps
Interface: RS-232C, CCITT V.24
Features: Autosqualizer,
Diagnostics, Failback

Date First Installed: 1982 BURROUGHS CORP. TA 1201 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bos. 1.800 bos Interface: RS-232C, CCITT V.24 Bell-Compatible: 202 Features: Autoequalizer, Diagnostics Date First Installed: 1977

BURROUGHS CORP.
TA 1203
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Mode: Half-Duplex,
Transmission Mode: Half-Duplex,
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps
Interface: RS-232C, COITT V.24
Bell-Compatible: 200
Peatures: Autoequalizer,
Autoenswer, Diagnostics
Date First Installed: 1977

BURROUGHS CORP.
TA 1801
Modem Class: Long-Haul
Transmission Technique:
Asynchronous

mission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -1,200 bps, 1,800 bps rface: RS-232C, CCITT V.24 Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Diagnostics Date First Installed: 1977

BURROUGHS CORP. TA 1802/1804 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex nission Rate: Asynchronous -1,800 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Feetures: Autoequalizer. Diagnostics, Multiport Date First Installed: 1977

BYTCOM, INC. 212 AD Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 1,200 bps Interface: RS-232C Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data. Reverse Channel, Diagnostics, Switchable Data Rate Distribution Method: Third-party Price: \$439 per installed to Date: 500 -1.000 Date First Installed: March 1983 (See Vendor Profile Page V-4)

CABLEBUS SYSTEMS CORP. MOD-1 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 2,400 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoanswer, Reverse Channel, Switchable Data Rates Distribution Method: End user Price: \$1.495 Number Installed to Date: Under 100

**CANOGA DATA SYSTEMS** CSA-100 Modem Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex

Date First Installed: 1981 (See Vendor Profile Page V-5)

Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 14,400 bps, 115K bps Interface: RS-232C, RS-422, V.35 Trensmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Clock Calendar, Switchable Data Rates, Continual Monitoring Distribution Method: End user Price: \$495 Number installed to Date: Under 100 Date First installed: October 1983 (See Vendor Profile Page V-5) CANOGA DATA SYSTEMS CSY-306-A-S Modem Class: Fiber-Optic Transmission Technic Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous 2,400 bps; Asynchronous/ Synchronous 4,000 bos Interface: RS-449, RS-422, V.35, Transmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Diagnostics, Continual Monitoring

Distribution Method: End user Price: \$1.500 Number Installed to Date: Under 100

Date First Installed: May 1983 CANOGA DATA SYSTEMS CSY-306-S Modern Class: Fiber-Optic Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous 2,400 bps: Asynchronous/ Synchronous 4,000 bps Interface: RS-449, RS-422, V.35 Bell-Compatible: 306 Transmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates. Continual Monitoring Distribution Method: End user Price: \$1.800 Number Installed to Date: 100 - 500 Date First Installed: May 1981

CANOGA DATA SYSTEMS CSY-3063AX-R Modem Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps, Synchronous - 4,000 bps Interface: RS-422, RS-423, V.35, T-1, TTL Bell-Compatible: 306A Transmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Clock Calendar, Continual Monitoring

Distribution Method: End user Price: \$1,200 Number Installed to Date: 100 - 500 Date First Installed: May 1983

**DM 2100** Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Coaxial Cable Features: Reverse Channel, Diagnostics, Switchable Data Rates, Loopback Distribution Method: Third-party Price: \$1,895

CATEL

Number Installed to Date: Under 100 Date First Installed: June 1981 (See Vendor Profile Page V-5) CROELECTRONICS

CERMETEK

CH1760E/1760 Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data. Diagnostics, Switchable Data Rates, Tone Detection Distribution Method: OEM Price: \$495

(See Vendor Profile Page V-5)

CERMETEK MICROELECTRONICS

INFO-MATE 212A Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212A Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party Price: \$595 Number Installed to Date: 100 - 500 Date First Installed: July 1983 CHUNG

TELECOMMUNICATIONS TURBO MUX Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -2,400 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines

Diagnostics: No Features: Autoanswer, Reverse Channel, Diagnostics Distribution Method: Third-party Price: \$695 Date First Installed: July 1983 (See Vendor Profile Page V-5) CHUNG TELECOMMUNICATIONS **TURBO 212A** Transmission Moder Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Multiport, Switchable Data Rates **Distribution Method: Third-party** Prime: 5995

CODENOLL TECHNOLOGY CORP. CODELINK 10 Modern Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Rate: Synchronous -10M bps Interface: RS-232C, RS-449, RS-422, TTL Transmission Medium: Fiber Optics Diagnostics: No Features: Autoanswer, Switchable Date Rates Distribution Method: End user, OEM, Third-party Price: \$500 Number Installed to Date: Under 100

Date First Installed: January 1983

(See Vendor Profile Page V-5)

CODENOLL TECHNOLOGY CORP. CODELINK 20 Modern Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Rate: Asynchronous -20,000 bns Interface: RS-232C, RS-449, RS-422, TTL Transmission Medium: Fiber Optics Features: Autoanswer, Switchable Data Rates Distribution Method: End user, OEM, Third-party

Price: \$500 Number installed to Date: Under Date First Installed: January 1983

CODENOLL TECHNOLOGY CORP CODELINK 50 Modem Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Rate: Synchronous -50M bps

Interface: RS-232C, RS-449, RS-422, TTL
Transmission Medium: Fiber Optica Diagnostica: No Distribution Method: End user, OEM, Third-party Price: \$500 Number Installed to Date: Under 100 Date First Installed: January 1983

CODENOLL TECHNOLOGY CORP. CODELINK 100

Modern Class: Fiber-Optic Transmission Technique: Asynchronous Synchronous Transmission Refe: Synchronous Transmission Refe: Synchronous 150M bps Interface: RS-232C, RS-449, RS-422, TTL Transmission Medium: Fiber Optics Diagnestics: No Diagnestics: Autoanswer, Switchable Data Rates Distribution Method: End user, OEM, Third-party Price: \$3,000 Number Installed to Date: Under 100

CODEX CORP.
224 DATA MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
Synchronous - 1,200 bps, 2,400 bps
literface: RS-232C, CCTT V.24,
CCTT V.28, 2-Wire
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines

Date First Installed: January 1983

Lines
Featurea: Autoequalizer,
Autoanswer, Fallback
Distribution Method: End user
Number Installed to Date: 5,000 10,000
(See Vendor Profile Page V-5)

GODEL CORP.
224/4/22 BIS DATA MODEM
Modern Cleas: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Moder Ful-Duplex
Transmission Rate: Asynchronous/
Synchronous - 1,200 bps, 2,400 bps
Interface: RS-238C, COTT V.22,
COTT V.24, COTT V.28
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines

Lines
Features: Autoequalizer,
Autoanswer, Diagnostics, Switchable
Data Rates
Distribution Method: End user
Date First Installed: March 1983

CODEX CORP.
5018R MULTIPLE MODEM
ENCLOSURE
NOCHEM FROM TRANSPORT
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex

Transmission Rate: Asynchronous/ Synchronous - 300 bps, 1,200 bps; Synchronous - 2,400 bps interface: RS-232C, RS-366 Bell-Competible: 103, 201, 202 Transmission Medium: Voice-Grade Lines Features: Autodia Distribution Method: End user

CODEX CORP.
5103/5113 DATA MODEMS
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous110 bps, 300 bps
Interface: RS-932C, CCITT V.24,
CCITT V.28
Belf-Compatible: 103, 113
Transmission Medium: Voice-Grade
Transmission Medium: Voice-Grade

Lines Features: Autodial, Autoanswer, Alternate Voice/Data, Local Loopback Distribution Method: End user

CODEX CORP.

\$201R DATA MODEM
Modem Classa Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Transmission Made: Half-Duplex,
Transmission Rate: Synchronous
1,200 bps, 2,400 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Bell-Compatible: 201
Features: Autodial, Autoanswer,
Alternate Voice/Data, Diagnostics,
Click Callendar

CODEX CORP.

5202R V.23
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous110 bps, 300 bps, 600 bps, 1,200
bps
Interface: RS-232C, CCITT V.24,
CCITT V.28, 2 or 4-Wire
Belf-Competible: 202
Transmission Middlum: Voice-Grade
Lines
Transmission Middlum: Voice-Grade
Lines
Loopback
Distribution Method: End user

CODEX CORP.
5208R DATA MODEM
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hail-Duplex,
Fuil-Duplex
Transmission Mede: Synchronous
4,800 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Bell-Compatible: 208
Transmission Medium: Voice-Grade
Lines

Features: Autoequalizer, Autoenswer, Diagnostics, Clock Calendar Distribution Method: End user Number Installed to Date: 5,000 -10,000

CODEX CORP.
5212/ACU
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
300 bps. Asynchronous
300 bps. Asynchronous
1,200 bps
Interface: R5-232C, CCITT V.24
Bell-Compatible: 103, 212
Transmission Riedium: Voice-Grade
Lines
Features: Autodial, Built-In Abort
Timer

CODEX CORP.
5212R
Modem Class: Long-Hauf
Transmission Technique:
Asynchronous, Synchronous
Transmission Modes: Full-Duplax
Transmission Medes: Full-Duplax
Transmission Rate: Asynchronous
Synchronous
1,200 bps:
Interface: R5-235C, CCITT V.24,
CCITT V.28, 2-Wire
Beil-Compatible: 103, 113, 212
Transmission Medium: Voice-Grade

Lines
Features: Autodial, Alternate
Voice/Data, Switchable Data Rates,
Automatic Speed Sensing
Distribution Method: End user

CODEX CORP.
S300 GBM
Modem Claes: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
56,000 bps, Asynchronous
56,000 bps, Asynchronous
56,000 bps, 50,000
bps, 64,000 bps
Interface: V.35
Bell-Competible: 303
Transmission Medium: Wide-Band

Transmission Medium: Wide-Bar Lines Features: Diagnostics, Clock Calendar Distribution Method: End user

CODEX CORP. CS 48FP

10.000

CS 49rP
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Transmission Rate: Synchronous 2,400 bps, 4,800 bps
Interface: RS-232C, CCITT V.24,
RS-423
Transmission Medium: Voice-Grade
Lines.
Peatures: Diagnostics
Distribution Muthod: End user
Price: \$4,175
Price: \$4,175
Price: \$4,175

Number Installed to Date: 5,000 -

CODRIX CORRP.
CS 96FP
Modem Cleas: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rete: Synchronous
4,800 bps, 9,600 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28, RS-423
Transmission Medium: Voice-Grade
Lines
Features: Autoequalizer,
Diagnostics
Diatribution Method: End user
Price: \$7,475

Price: \$7.475

CODEX CORP.
CS 4800

Modem Cleas: Long-Haul
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 2,400 bps, 4,800 bps, 9,600 bps,
Asynchronous/Synchronous 7,200
bps
interface: RS-232C, CCITT V.24,
CCITT V.28, CCITT V.29, RS-423
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer, Alternate
Voice/Data, Diagnostics, Clock
Calendar, Fallback, Switchable Data
Rates, Integral Four-Channel Mux
Distribution Method: End user

Price: \$4,675

10,000

CODEX CORP. Modern Class: Long-Haul Transmission Technique: Synchronous mission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps; Asynchronous/Synchronous 7,200 Interface: RS-232C, CCITT V.24, CCITT V.28, CCITT V.29 Lines Features: Autoequalizer, Alternate Voice/Data, Diagnostics, Clock Calendar, Fallback, Switchable Data Rates, Integral Four-Channel Mux Distribution Method: End user Price: \$7,975

er Installed to Date: 5,000 -

10,000 CODEX CORP. LSI 24/24 Modern Class: Long-Haul

Inform Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Mode: Full-Duplex Transmission Rate: Asynchronous Synchronous 2,400 bps Interface: RS-232C, CCTT V.24, CCTTT V.28 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoequalizer, Autoenswer, Alternate Voice/Data.

per Installed to Date: 5,000 -

Clock Calendar, Local Loopback Distribution Method: End user Price: \$2,650

#### CODEX CORP.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. ission Rate: Synchronous Trans 2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24, **CCITT V.28, MIL 188C** Transmission Medium: Voice-Grade Lines Features: Autoequalizer. Diagnostics, Clock Calendar, Fallback Distribution Method: End user Price: \$3,500 Number Installed to Date: 10,000 -

#### CODEX CORP.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -4.800 bps Interface: RS-232C, CCITT V.24, MIL 188C Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Clock Calendar, Fallback, Local/Remote Loopback Distribution Method: End user Price: \$3,500

#### CODEX CORP. LSI 48/V.27 BIS/TER

Modern Class: Long-Haul

Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex mission Rate: Asynchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.28 nission Medium: Voice-Grade Lines Features: Autoequalizer. Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Clock Calendar, Fallback, Local/Remote Loopback Distribution Method: End user Price: \$3,500 Number Installed to Date: 5,000 -

#### CODEX CORP.

10,000

LSI 96FP Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -9,600 bps, Asynchronous/ Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24. **CCITT V.28, MIL 188C** 

Transmission Medium: Voice-Grade Features: Autoequalizer, Alternate Voice/Data, Diagnostics, Clock Calendar, Fallback Distribution Method: End use Number installed to Date: 10,000 -50 000

CODEX CORP. LSI 96/V.29 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade

Features: Autoequalizer, Alternate Voice/Data, Diagnostics, Clock Calendar, Fallback Distribution Method: End use Number installed to Date: 10,000 -

CODEX CORP.

50.000

LSI 4800 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24. **CCITT V.28, MIL 188C** Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Alternate

Voice/Data, Reverse Channel, Clock Calendar, Fallback, Switchable Data Rates Distribution Method: End user Price: \$3,500 er Installed to Date: 10,000 -50,000

#### CODEY CORP. LSI 9600

Modern Class: Long-Haul

Transmission Technique:

Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous 4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24, **CCITT V.28, MIL 188C** Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Alternate Voice/Data, Reverse Channel, Diagnostics, Clock Calendar, Fallback, Switchable Data Rates Distribution Method: End user Price: \$6,800 Number Installed to Date: 10,000 - 50,000

CODEX CORP. LSI E96/V.29 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Transmission Madium: Voice-Grade Lines Features: Autoequalizer, Diagnostics, Clock Calendar, Fallback Distribution Method: End user Price: \$6,800 Number Installed to Date: 10,000 -

CODEX CORP. LSI E9800 Modern Class: Long-Haul Transmission Mode: Half-Duplex. Full-Duplex ion Rate: Synchronous -4 800 hps 9 600 hps: Asynchronous/Synchronous 7,200 bps

Interface: RS-232C, CCITT V.24, CCITT V.28. 4-Wire Bell-Compatible: None Transmission Medium: Voice-Grade Features: Autoequalizer

Diagnostics, Clock Calendar, Distribution Mathod: Fnd user

CODEX CORP.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex ssion Rate: Synchronous -Transi 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade

Features: Autoequalizer, Diagnostics, Clock Calendar, Faliback Distribution Method: End user Number Installed to Date: 10,000 -

CODEX CORP. MX 2400 DATA MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous namission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -1,200 bps; Asynchronous/ Synchronous - 2,400 bps Interface: RS-232C, CCITT V.24 CCITT V.26, CCITT V.28, MIL 188C Bell-Compatible: 201 sion Medium: Voice-Grade Lines Features: Autodial, Autoequalizer, Autoanswer, Diagnostics, Fallback Distribution Method: End user Number Installed to Date: 5,000 -

CODEX CORP. Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -1,200 bps, 9,600 bps, 19,200 bps Interface: RS-232C, CCITT V.24, CCITT V.29 Transmission Medium: Voice-Grade Lines

Features: Autoequalizer. Diagnostics, Fallback ber installed to Date: 500 -

CODEX CORP. 8150 LDSU

Modern Class: Short-Haul Transmission Technique: Asynchronous smission Mode: Half-Duplex, Full-Duplex sion Rate: Asynchronous -Transi 19.200 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 43401 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer Number installed to Date: 500 -1.000 Date First Installed: December 1982

CODEX CORP. 8250 LDSU Modem Class: Short-Hau Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex mission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Twisted Pair Features: Autoequalizer Number Installed to Date: 5,000 -10 000 Date First Installed: March 1982

COHERENT COMMUNICATIONS SYSTEMS SPM-94A

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Features: Diagnostics, Simulated Voice/Data Distribution Method: End user, OEM Price: \$500 Number Installed to Date: Under 100 Date First Installed: August 1983 (See Vendor Profile Page V-5)

COMMUNICATIONS SYSTEMS CORP LINEMATE 192 Modem Class: Short-Haul

#### Modems

Transmission Technique:
Asynchronous, Strenemission Miode: Fuil-Dupiex
Transmission Miode: Fuil-Dupiex
Transmission Miode: Asynchronous/
Synchronous - 14,400 bps
Intisrface: RS-232C
Internation Middlum: 2-Wire
Nonloaded
Diagnostica: No
Features: Diagnostics, Switchable
Data Rates, Simulated Voica/Data
Distribution Method: End user,
Third-party
Price: \$450
Number Installed: Sectember
100
100

Pate First Installed: Sectember

COM DATA 151A2-13 Modem Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103
Transmission Medium: Voice-Grade Lines Feetures: Carrier Light Distribution Method: End user Price: \$127 Date First Installed: January 1983 (See Vendor Profile Page V-5)

COME DATA
350/352/354F3-72
Modem Class: Line Driver
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rete: Asynchronous
110 bps, 300 bps, 1200
bps, 1,300 bps, 1,200
bps, 1,300 bps, 1,400 bps
Interface: R5E-322C
Transmission Medium: Metallic
Circuit
Features: Diagnostics
Distribution Method: End user
Price: \$117 to \$296
bete First Installect: January 1981

GOM DATA
154E2-14
Modem Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 300 tops
Interface: RS-232C
Belf-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Diagnostics: No
Diagnostics: 103
Di

COM DATA 206 A/B Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Fulf-Duplex, Fulf-Duplex, Fulf-Duplex, Transmission Rate: Synchronous - 4,800 bps Interface: RS-232C Belf-Compatible: 208 Transmission Medium: Voice-Grade Lines Diagnostica: Yes; Bulli-In Peatures: Autosqualizer, Autoanswer, Alternate Voice/Data, Diagnostics: Diagnostics:

Date First Installed: January 1981

COM DATA
212E2-32
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 1,200 bps
Interface: RS-232C
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Disgnostics: No
Distribution Method: End user
Price: \$377
Date First Installed: March 1983

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous-300 bps Interface: RS-232C Belf-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Originate Mode Only Distribution Method: End user Price: \$157 Date First Installed: January 1970

302A2-13

COM DATA

302A2-33

Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Raise: Asynchronous
300 bps
Glober St. 232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Treatures: Originate/Answer
Distribution Method: End user
Price: \$187
Dete First Installed: January 1970

COM DATA 30282-13 Nodem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -300 bps

Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Originates Only Distribution Method: End user Price: \$177 Date Price: \$177 Date Price: \$170 Date Price: \$177

30282-33
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Hedium: Voice-Grade
Lines
Diagnostics: No
Features: Originate/Answer
Distribution Method: End user
Price: \$247

Date First Installed: January 1970
COM DAYA
302C2-13L
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Belf-Compatible: 103
Transmission Medium: Voice-Grade

Transmission Medium: Voice-Grad Lines Diagnostics: No Distribution Method: End user Price: \$297 Date First Installed: January 1977

COM DATA
305E2-12
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Mate: Asynchronous110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Originates Only
Distribution Method: End user

Date First Installed: January 1981

COM DATA 312E2-42 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps

Interface: RS-232C

Price: \$117

Beil-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Feetures: Autoanswer, Digital/

Analog Loopback Distribution Method: End user Price: \$397 Date First Installed: January 1982

COM DATA
312F2-22L
Modem Cless: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous/
Synchronous - 1,200 bps Interface: RS-232C
Belt-Compatible: 212
Features: Digital/Analog Loopback
Istribution Method: End user
Price: \$337
bet First Installed: January 1982

330E2-12L
Modem Cless: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Festures: Manual Answer
Distribution Method: End user
Price: \$137
Date First Installed: January 1978

330E2-42L
Modem Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous300 bps
Interface: R9-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Autoanswer
Distribution Method: End user
Price: \$137
Date First Installed: January 1978

COM DATA

COM DATA

332E2-12L
Modem Clees: Long-Haul
Transmission Technique:
Asynchronous
Transmission Robe: Half-Duplex
Transmission Robe: Asynchronous
Transmission Robe: Asynchronous
Transmission Robe: Asynchronous
Tilo bps, 300 bps, 600 bps, 1,200
bps
Interface: RS-232C
Belf-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Distribution Method: End user
Price: \$187
Date First Installed: January 1979

COM DATA 332E2-42L Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Ratie: Asynchronous - 10 bps, 300 bps, 600 bps, 1,200 bps Interface: RS-232C Bielf-Competible: 202 Transmission Medium: Voice-Grade Lines Diagnostica: No Features: Autoanswer Distribution Method: End user Price: \$247 Date First Installed: January 1979 other First Installed: January 1979 other First Installed: January 1979

COM DATA
332F7/332F8
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
300 bps, 1,200 bps
interface: R5-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Alternate Voice/Data,
Switchalzb Data Rates, Point to
Point
Point
Diatribution Method: End user
Price: \$591
Date First Installed: January 1981

COM DATA
334E2-12L
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex
Transmission Rais: Synchronous
2,400 bps
Interface: RS-232C
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Disgnostics: No
Features: Autoequalizer,
Autoanswer, Busy Out
Distribution Method: End user
Price: SS37

COM DATA
334E2-421.
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex
Transmission Rate: Synchronous
2,400 bps
Interface: RS-232C
Belf-Competible: 201
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Autoequaizer, Busy Out
Distribution Method: End user
Price: \$587
Date First Installed: January 1981

Date First Installed: January 1981

COM DATA 370E2-12 PHONEM Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C
Bell-Competible: 103
Transmission Meditum: Voice-Grade
Lines
Diagnostica: No
Features: Alternate Voice/Data,
Manual Answering
Distribution Method: End user
Price: \$227

Date First Installed: January 1981

COM DATA

37062-42
Modern Cless: Long-Haul
Transmission Technique:
Asynchronous
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Peatures: Autoanswer, Alternate
Voice/Data, One Number Disler
Distribution Method: End user
Price: \$277
Date First Installed: January 1981

COM DATA
P 212 A
Modern Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
110 bps, 300 bps: Asynchronous
110 bps; 300 bps; 300

COM DATA ME-2D Modern Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous smission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bos. 4,800 bps. 9,600 bps. 14,400 bos Interface: RS-232C Transmission Medium: Cables Distribution Method: End user Price: \$510 Date First Installed: January 1983

COMDESION, INC.
TM-1200
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Moder: Full-Duplex
Transmission Moder: Full-Duplex
Transmission Rete: Asynchronous 300 bps: Asynchronous 300 bps: Asynchronous Hardrace: RS-232C, CCITT V.24
Bell-Competible: 103, 113, 212A
Transmission Medium: Voico-Grade
Lines

Diagnostics: Yes; Bullt-in Features: Autodial, Autoequalizer, Autoenswer, Switchable Data Rates, Abort Timer Distribution Method: End user, Third-party Price: \$750 Number Installed to Dete: Under 100 Date First Installed: April 1983 (See Vendor Profile Page V-6)

COMDITSION, INC.
TM-2400
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous 2,400 bps
Interface: RS-232C, CCITT V.24
Bell-Compatible: 2018
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-In
Festures: Diagnostics, Clock
Calendar

Distribution Method: Third-party

Number Installed to Date: Under

Price: \$750

Dete Firet Inetalled: January 1983

COMDESIGN, INC.
TM-4800

Modern Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Hall-Dupkox,
Full-Dupkox
Transmission Mode: Hall-Dupkox,
Full-Dupkox
Transmission Resis: Asynchronous/
Synchronous - 4,800 bps
Interface: RS-232C, CCITT V-24
Bell-Compatible: 208, 208B
Transmission Meditum: Voice-Grade
Linss
Diagnostics: Yes; Built-in
Feethres: Autoequalizer,

Feetures: Autoequalizer, Autoanswer, Diagnostics, Clock Calendar Distribution Method: End user, Third-party Price: \$1,750 Number installed to Date: Under 100 Date First Installed: February 1983

COMDESION, INC.
TM-900
TM-900
INC.
TM-900
INC.
Transmission Technique:
Synchronous
Transmission Mode: Ful-Duplex
Transmission Rate: Synchronous
-4,800 bps, 9,600 bps;
Interface: RS-232C, CCITT V.24,
CCITT V.29
Transmission Medium: Voice-Grade

Transmission Medium: Voice-Gri Lines Diagnostics: Yes; Built-in Features: Autoqualizer, Clock Calendar, Fallback Distribution Method: End user, Third-party Price: \$2.750 Number Installed to Data: Under 100 Date First Installed: February 1983

COMMODORIE BUSINESS
BACHINES, INC.
-1850 AUTOMATIC MODEM
Modem Class: Long-Haul
Tranemission Technique:
Asynchronous
Tranemission Rate: Asynchronous300 bps
Interface: RS-232C
Tranemission Medium: Voice-Grade
Lines
Disgnostics: No
Features: Autodial, Autoenswer,
Alternate Voice/Data, Reverse
Channel
Distribution Method: End user,
Third-party
Number Installed to Date: 500 1,000

COMMODORE BUSINESS
BACHINES, INC.
C-1600
Modem Cless: Short-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
100 bps
Interface: RS-232C
Transmission Modium: Voice-Grade
Lines
Festures: Reverse Channel,
Switchable Data Rates

Date First Installed: August 1983 (See Vendor Profile Page V-6)

Date First Installed: May 1983
COMMUNICATION RESEARCH
CORP.
100
Modern Class: Short-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex

Asynchronous Transmission Mode: Full-Duplex Transmission Rete: Asynchronous 110 bps, 300 bps, 400 bps, 1,300 bps, 1,800 bps, 2,400 bps, 4,800 bps, 4,900 bps, 4,90

Price: \$315 Number Installed to Date: 500 -1,000 Date First Installed: July 1982 (See Vendor Profile Page V-6)

COMMUNICATION RESEARCH GORP. 400 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 9,800 bps, 9

bps, 9,600 bps Interface: RS-232C, AC Power Line Transmission Medium: AC Power Line Features: Multiport Distribution Method: Third-party Price: \$475 Number installed to Date: 100 - 500 Date First installed: February 1983

#### COMPLEX SYSTEMS, INC.

LS SEK Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Dunley Trans ission Rate: Synchronous -56,000 bps Interface: CCITT V.35 Transmission Medium: Voice-Grade Lines, Digital Links Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: Third-party Price: \$650 Number Installed to Date: Under 100 Date First Installed: December 1983 (See Vendor Profile Page V-6)

#### COMPLEX SYSTEMS, INC. LVS 76.8

Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Transmission Rate: Synchronous -2.400 hos. 4.800 bos. 9.600 bos. 14,400 bps, 19,200 bps Interface: RS-232C, CCITT V.35 elsaion Medium: Voice-Grade Lines, Digital Links Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$650 Number Installed to Date: Under **Date First Installed: November 1983** 

## COMPRE COMMUNICATIONS.

LH96 Modem Class: Long-Haul Transmission Technique: Transmission Mode: Full-Duplex Transmission Rate: Synchronous -600 bps; Asynchronous/ Synchronous - 7,200 bps Interface: RS-232C Bell-Competible: 209 Transmission Medium: Voice-Grade Diagnostics: Yes; Add-on Features: Autoequalizer, Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user. Third-party Price: \$2,650 Number installed to Date: Under 100 Date First Installed: May 1981 (See Vendor Profile Page V-6)

COMPUTER COMMUNICATIONS SPECIALISTS, INC. AUDIO MODEM m Class: Long-Haul

Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1,200 bps Bell-Compatible: 202 Transmission Medium: Voice-Grade Diagnostics: Yes; Add-on Factures: Autodial, Autoanswer.

Alternate Voice/Data, Diagnostics, Clock Calendar, Switchable Data Distribution Method: End user

Price: \$4,895 Number Installed to Date: Under 100

Date First installed: 1982 (See Vendor Profile Page V-6)

#### COMPUTER DEVELOPMENT, ET SERIES INTELLIGENT MODEMS

Rodem Class: Long-Haul Transmission Tache Asynchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C, CCITT V.23 Bell-Compatible: 103, 212 Diagnostics: Yes; Built-in Features: Autodial. Autoanswer. Alternate Voice/Data, Reverse

Channel, Diagnostics, Switchable Data Bates Distribution Method: OEM, Third-Price: \$495 to \$695

Number Installed to Date: Under 100 Date First Installed: November 1983 (See Vendor Profile Page V-6)

#### COMPUTER DEVELOPMENT.

ETC-EXECUTIVE TELECOMMUNICATIONS COMPUTER Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Dunley Full-Duplex mission Rate: Asynchronous -300 bps; Asynchronous/ Synchronous 1,200 bps Interface: RS-232C, CCITT V.23 Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Clock

Calendar, Switchable Data Rate Distribution Method: OEM, Third-Price: \$1 095 to \$1 295 **Date First Installed: August 1983** 

COMPUTER DEVELOPMENT. INC.

EXECUTIVE TELECOM COMPUTER (MULTI-USER) Modern Class: Long-Haul

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Asynchronous -300 bps: Asynchronous Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Multiport, Clock Calendar, Switchable Data

Distribution Method: OEM, Third-Price: \$1,695

COMPUTROL 30-0078 Modern Class: Line Driver Transmission Technique: Asynchronous namission Mode: Half-Duplex. Tra

Full-Duplex ission Rate: Asynchronous -2.000 bps Interface: TTL Transmission Medium: Coaxial

Distribution Method: End user, OEM Price: \$150 to \$200 Number installed to Date: 5,000 -10,000

Date First Installed: January 1979 (See Vendor Profile Page V-7)

#### COMPUTROL 30-0080

Modern Class: Line Driver Transmission Technique: Synchronous namission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous Distribution Method: End user, OEM Price: \$150 to \$200

COMREX INTERNATIONAL CR-103 COMMUNICATOR Modern Class: Long-Haul Transmission Technique:

Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial Price: \$159

Date First Installed: November 1983

(See Vendor Profile Page V-7)

COMSPEC. INC. DATATALKER 9,600C Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Dunley Full-Duplex

mission Rate: Synchronous -9,600 bps

Interface: RS-232C Transmission Medium: Voice-Grade Lines, Radio Links Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data. Diagnostics, Fallback, Switchable Data Rates, Autocall Forward Distribution Method: End use Number Installed to Date: Under Date First Installed: September 1983

(See Vendor Profile Page V-7)

#### COMTECH DATA CORP.

**GB 56** Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex
Transmission Rate: Synchronous -56,000 bps Interface: CCITT V.35, V.36 Bell-Compatible: 303C Transmission Medium: Group Spectrums Features: Diagnostics Distribution Method: End user Price: \$6,000 Number Installed to Date: 100 - 500 Date First Installed: 1979 (See Vendor Profile Page V-7)

#### COMTECH DATA CORP.

GB 168 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 168,000 bns Interface: RS-449, CCITT V.35 Bell-Compatible: 303C Transmission Medium: Group Spectrums Features: Autoequalizer, Diagnostics, Multiport, Fallback, Switchable Data Rates Distribution Method: End user Price: \$17,500 Number installed to Date: Under Date First Installed: December 1983

COMTECH DATA CORP.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 56,000 bps Interface: RS-449, CCITT V.35, TTL Transmission Medium: Microwave Diagnostics: Yes; Built-in Features: Diagnostics
Distribution Method: End user, OEM Price: \$4,650 Number Installed to Date: Under 100 Date First Installed: March 1981

COMTECH DATA CORP. **SM200A** 

Modem Class: Long-Haul mission Technique: Synchronous

Transmission Mode: Full-Duplex nemission Rate: Synchronous -56,000 bos Interface: RS-449, CCITT V.35, TTL Transmission Medium: Satellite Diagnostics: Yes; Add-on Features: Autoqualizer, Fallback Distribution Method: End user Price: \$14,300 per installed to Date: 500 -1.000 Date First Installed: January 1980

COMTECH DATA CORP. M816

Modern Class: Short-Haul Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2M bps Interface: RS-449, CCITT V.35 Transmission Medium: Twisted-Pair Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$2,000 Number Installed to Date: Under Date First Installed: March 1983

CONTECH DATA CORP.

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -56,000 bos Interface: RS-449, CCITT V.35, Transmission Medium: Coaxial Cables Diagnostics: No Features: Autoequalizer, Diagnostics Distribution Method: End user, OEM Price: \$4,650 Number Installed to Date: 100 - 500 Date First Installed: January 1981

COM/TECH SYSTEMS, INC. MODEMULATOR 402A Modem Class: Modem Eliminator Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 14,400 bps Interface: RS-232C Transmission Medium: RS-232 Cable Diagnostics: No Features: Diagnostics, Switchable Data Rates, Loopback Distribution Method: End user Price: \$390

Number Installed to Date: Under Date First Installed: February 1983

CONCORD DATA SYSTEMS. **CDS 212** Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps

Interface: RS-232C Bell-Competible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user, OEM, Third-party Price: \$700 Number Installed to Date: Under Date First Installed: November 1981 (See Vendor Profile Page V-7)

CONCORD DATA SYSTEMS.

CDS 224 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps Interface: RS-232C Transmission Mediu n: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer. Autoanswer, Diagnostics, Fallback, Switchable Data Rates

Distribution Method: Third-party Price: \$995 to \$1.195 per installed to Date: 500 -1,000

Date First Installed: November 1982

CONCORD DATA SYSTEMS, CDS 224 TM

Modem Class: Long-Haul Transmission Technique:

Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps nterface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user. OEM, Third-party Price: \$995 Number installed to Date: 500 -

Date First Installed: March 1983 CONCORD DATA SYSTEMS.

CDS 224 TM AUTODIAL

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: RS-232C Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer. Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user. OEM. Third-party

Price: \$1,195 Number Installed to Date: Under 100 Date First Installed: January 1983

CONCORD DATA SYSTEMS. CDS V.22

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1 200 bos Interface: CCITT V.24, CCITT V.28 Bell-Compatible: 212
Transmission Medium: Voice-Grade

Lines Diagnostics: No Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates
Distribution Method: OEM, Thirdparty

Price: \$950 Number installed to Date: 5,000 - 10,000 Date First Installed: November 1981

CONCORD DATA SYSTEMS.

INC. CDS V.22 BIS Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: CCITT V.24, CCITT V.28 Transmission Madium: Voice-Grade Lines

Diagnostics: No Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user, OEM, Third-party Price: \$995 Number installed to Date: 500 -Date First Installed: April 1983

CONCORD DATA SYSTEMS, CDS V.22 BIS AUTODIAL

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: CCITT V.24, V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: OFM. Third-Price: \$1,195

Number installed to Date: Under 100 Date First Installed: August 1983 CROMEMCO, INC. MDM-12000

Modern Class: Long-Haul

Asynchronous, Synchronous Yranamission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Reverse Channel, Diagnostics Price: \$1.495 Date First installed: 1983 (See Vendor Profile Page V-8)

Transmission Technique:

DATA CONTROL SYSTEMS CCM COAXIAL CABLE MODEM Modern Class: Short-Haul Transmission Technique: Asynchronous, Synchronous Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 1,800 bps, 4,800 bps, 9,600 bps, 14,400 bps; Synchronous - 2,400 bps Interface: RS-232C, RS-422 Transmission Medium: Coaxial, Triaxial Cables Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party

Price: \$165 to \$875 Number installed to Date: 500 -Date First Installed: 1978 (See Vendor Profile Page V-9)

DATA CONTROL SYSTEMS

Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Asynchronous -1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, RS-422 Transmission Medium: Metallic Circuit

Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party Price: \$165 to \$875 Number Installed to Date: 500 -

Date First installed: 1978

DATA CONTROL SYSTEMS

**SR120** Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex nission Rate: Synchronous 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, RS-422 Transmission Medium: Metallic Circuit Diagnostics: Yes; Built-in Features: Reverse Channel,

Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party Price: \$165 to \$875 Number Installed to Date: Under 100 Date First Installed: 1983

#### DATA CONTROL SYSTEMS SR202

Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps, 4,800 bps, 9.600 bos. 14.400 bos. Interface: RS-232C, RS-422 Transmission Medium: Metallic Circuit Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user. Third-party Number installed to Date: 500 -1.000 Date First Installed: 1978

#### DATA CONTROL SYSTEMS RAM

Modern Class: Power Line Carrier Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, RS-422 Transmission Medium: Power Line Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party Price: \$165 to \$875 per Installed to Date: 500 -1 000 Date First Installed: 1978

#### DATAGRAM CORP.

D 2400 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 4,800 bps Interface: RS-232C, CCITT V.24 Transmission Madlum: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Fallback, Switchable **Data Rates** Distribution Method: End user

#### DATAGRAM CORP.

Price: \$995

D 4800 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -

(See Vendor Profile Page V-9)

4,800 bps Interface: RS-232C, CCITT V.24, V.27 Trans ission Medium: Voice-Grade Lines Diagnostics: No Features: Autoequalizer, Fallback, Switchable Data Rates Distribution Method: End user. Third Party Date First Installed: March 1984

## DATAGRAM CORP.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Diagnostics. Fallback, Switchable Distribution Method: Fnd user Price: \$2 250

#### DATAPOINT CORP. 9478/9479

Modem Class: Long-Haul Transmission Technique: Asynchronous namission Mode: Full-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: No Distribution Method: End user Price: \$995 Date First Installed: January 1978 (See Vendor Profile Page V-9)

#### DATAPROBE, INC.

MDR 103 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex sion Rate: Asynchronous -300 bos Interface: RS-232C, 20 MA Current Loop, 60 MA Current Loop Transmission Medium: Voice-Grade Lines, Wide-Band Lines Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$450 Number Installed to Date: Under 100 Date First Installed: November 1983 (See Vendor Profile Page V-9)

#### DATAPRODUCTS CORP. DDU-1

Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps; Asynchronous/ Synchronous - 7,200 bps

Interface: RS-232C, MIL 188C, MIL 188/114 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autosqualizer, Diagnostics, Switchable Data Rates, Polling/Multipoint rtion Method: End user Distri Price: \$700 Number Installed to Date: 100 - 500 Date First Installed: June 1980 (See Vendor Profile Page V-9)

#### DATAPRODUCTS NEW ENGLAND, INC.

DDU-1 Modern Class: Line Driver Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1,200 bps, 2,400 bps, 7,200 bps; Synchronous - 1,800 bps. 4,800 bps. 9,600 bps, 14,400 bps Transmission Medium: Unconditioned Cable Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$798 Number Installed to Date: 500 -1.000

#### DATATEL, INC. DCP 3000

Date First Installed: 1967

(See Vendor Profile Page V-9)

Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair

Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: End user Price: \$200 Number Installed to Date: 500 -1.000 Date First Installed: 1980 (See Vendor Profile Page V-10)

#### DATATEL, INC.

DCP 3010 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps interface: Burroughs

Bell-Competible: 43401 Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-in Features: Diagnostics

Distrib ution Method: End user Price: \$260 Number Installed to Date: Under 100 Date First Installed: June 1980

#### DATATEL, INC.

**DCP 3020** Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rete: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-in Features: Diagnostics, Simulated Dial Control Sign

Dial Control Method: End user Price: \$250 Number Installed to Date: Under 100 **Date First Installed: January 1981** 

#### DATATEL, INC.

DCP 3050 Modern Class: Short-Haut Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19.200 bps; Asynchronous/ Synchronous - 3,600 bps erface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: End user Price: \$420 mber installed to Date: 500 -1.000 Date First Installed: January 1981

#### DATATEL, INC.

**DCP 3055** Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair Disgnostics: Yes: Built-in Features: Diagnostics, Switchable Data Rates, Auto Speed Detection Distribution Method: End user Price: \$550 Number installed to Date: Under 100 Date First Installed: October 1982

#### DATATEL, INC.

DCP 3057 Modern Class: Short-Haul Transmission Technique: Synchronous

Transmission Mode: Half-Duplex, Full-Duplex, Simplex Full-Duplex, Simplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 56,000 bps, 14,400 bps, 56,000 bps interface: RS-232C Beel-Competible: 43401 Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-In Features: Diagnostics Distribution Method: End user Price: \$500 Number Installed to Date: Under 100 Date First Installed: January 1983

DATATEL, BRG.
DOP 3080
Modern Class: Short-Hauf
Transmission Technique:
Synchronous
Transmission Rete: Synchronous58,000 bps. Asynchronous/
Synchronous - 48,000 bps. 72,000
bg.
Interface: RS-232C, RS-422, V.35
Transmission Medium: Twisted-Pair
Diagnostics: Yes; Bull-in
Features: Diagnostics, Automatic
Speed Detection
Distribution Method: End user
Price: \$950
Number Installed to Date: Under
100
Date First Installed: December 1983

DAYATEL, INC.
DCP 3070
Modem Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Rate: Synchronous
Transmission Rate: Synchronous
Transmission Rate: Synchronous
Transmission Medium: Twisted-Pair
Diagnostics: Yes; Built-In
Features: Diagnostics, Automatic
Speed Detection
Distribution Method: End user
Price: \$1,400
Date First Installed: January 1984

DATATEL, INC. Modem Class: Short-Haul Transmission Technique: Synchronous namission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps; Asynchronous/ Synchronous - 3,600 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair Diagnostics: Yes: Built-in Features: Diagnostics Distribution Method: End user Price: \$420 Number installed to Date: 500 -1.000 Date First installed: January 1981

DATATEL, INC. DCP 3155 Modern Class: Short-Haul Transmission Technique:
Synchronous
Transmission Mode: Ful-Duplex,
Simplex
Transmission Rate: Synchronous
-1,200 bps, 2,400 bps, 4,800 bps,
9,600 bps, 14,400 bps
interface: RS-232C
Bell-Compatible: 43401
Transmission Medium: Twisted-Pair
Features: Diagnostics, Switchable
Data Rates, Automatic Speed
Detection
Distribution Method: End user
Price: \$550
Number Installed to Date: Under
100
Dete First Installed: October 1982

DATEC, INC.
33
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Bell-Compatible: 103, 113

Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Diagnoste; Ver; Built-in
Features: Autodial, Autoequalizer,
Autoanswer, Alternate Voice/Data,
Autoanswer, Alternate Voice/Data,
Olagnostes, Switchaibe Data Rates
Distribution Method: Third-parry
Prices: \$195 to \$599
Number Installed: 1981
(See Vendor Profile Page V-10)

DATEC, INC.

212

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$195 to \$599 Number installed to Date: 5,000 -10,000

Date First Installed: 1980

DATEC, INC.
PAL 103

Modern Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines

Diagnostics: Yes; Built-in Features: Autocial, Autoequalizer, Autoenswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$195 to \$599 Date First Installed: 1984

DATEC, INC.
PAL 212
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps; 1,200 bps
Interface: RS-232C
Interface: RS-232C
Transmission Medium: Voice-Grade
Lines

Diagnostics: Yes; Built-in Feetures: Autoclai, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$195 to \$599 Date First Installed: 1983

DATEC, INC.
PAL PLUS
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
300 bps. 1,200 bps.
Interface: R5-232C
Bell-Compatible: 103, 113, 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-In

Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Multiport, Switchable Data Rates Distribution Method: Third-party Price: \$195 to \$599 Date First Installed: 1983

DELTELEPRODUCTS, INC.
ADT-3
Modem Clases: Line Driver
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps, 1,200
bps, 1,600 bps, 14,400 bps, 4,800
bps, 9,600 bps, 14,400 bps, 19,200
bps
Interface: RS-232C

Interrace: NS-232C Transmission Medium: Voice-Grade Lines, Unload Metaliic Pairs Diagnostics: No Features: Diagnostics, Switchable Data Rates, Extended Ring Option Diatribution Method: End user Price: \$225 Number Installed: July 1978 (See Vendor Profile Page V-10)

DEI-TELEPRODUCTS, INC. 2000 Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Blode: Half-Ouplex, Full-Ouplex, Full-Ouplex, Transmission Rate: Synchronous-56,000 bpg; Asynchronous-9, Synchronous-64K bps Interface: CCITT V.35
Transmission Medium: Voice-Grade Lines, Unload Metallic Pairs Diagnostics: No Features: Diagnostics: No Features: Diagnostics: No Features: Diagnostics: Switchable Data Rates Distribution Method: End user Price: \$689
Number Installed: Doubs: 200
Date First Installed: August 1983
DEL-TELEPRODUCTS, INC.

ASR-3
Modem Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Fill-Duplex
Transmission Rate: Synchronous
-2,400 bps, 4,800 bps, 9,800 bps,
14,400 bps
Interface: R8-232C
Transmission Medium: Voice-Grade
Lines, Unicad Metalilo Pairs
Diagnostics: Switchaiue
Data Rates, Extended Ring Option
Distribution Method: End user
Price: 3445
Number Installed to Data: 6,000
Data Plates, Extended Data: 6,000
Data Plates Installed: 1979

DEI-TELEPRODUCTS, INC.
ELD-1
Modem Class: Short-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
110 bps. 300 bps. 600 bps. 1,200
bps. 1,600 bps. 2,400 bps. 4,800
bps. 9,600 bps. 14,400 bps. 9,900 bps
interface: RS-232C

Transmission Medium: Voice-Grade Lines, Unload Metaliic Pairs Diagnostics: No Features: Diagnostics Distribution Metahod: End user, Third-party Price: \$175 Number Installed to Date: 500 -1,000 Date First Installed: January 1981

DEVELCON ELECTRONICS, INC. 710 ACQUISTIC COUPLER

Modem Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex. Full-Duplex. Transmission Rate: Asynchronous - 110 bps, 300 bps Interface: RS-232C, 20 MA Current Loop Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Alternate Voice/Data Distribution Method: End user, OEM. Third-parry Price: \$195 Number Installed to Date: 5,000 -10,000 Date First Installed: September 1978 (See Vendor Profile Page V-10)

#### DEVELOON ELECTRONICS.

2X212 MODEMPLEXER

INC.

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos. 1,200 bos. Interface: RS-2320 Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autodial, Autoequalizer. Autoanswer, Diagnostics, Multiport, Switchable Data Rates, Stored Directory Distribution Method: End user, OEM, Third-party Price: \$995 Number Installed to Date: Under 100

#### Date First Installed: August 1983 DEVELOON ELECTRONICS.

6212 SMART MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps Interface: RS-2320 Bell-Compatible: 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Feetures: Autodial. Autoequalizer. Autoenswer, Diagnostics, Switchable Data Rates, Stored Directory Distribution Method: End user OEM, Third-party Price: \$495 Number Installed to Date: Under Data First Installed: January 1984

#### DEVELCON ELECTRONICS,

**7212 MODEM** 

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Alternate Voice/Data Diagnostics, Switchable Data Rates Distribution Method: End user, Third-party Pring: \$575 Number Installed to Date: 100 - 500 Date First Installed: July 1982

## DEVELOON ELECTRONICS.

8212 SWART MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Competible: 103, 113, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Diagnostics, Switchable Data Rates, Stored Directory Distribution Method: End user, OEM. Third-party Price: \$650 Number Installed to Date: 500 -1,000 Date First Installed: November 1982

#### DEVELOON ELECTRONICS.

9123 MODEM

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user, OEM, Third-party Number Installed to Date: 100 - 500 Date First Installed: 1982

#### DEVELCON ELECTRONICS,

Modern Class: Long-Haul

Transmission Technique:

9202 MODEM

Asynchronous namission Mode: Half-Duniex Full-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Bell-Competible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Reverse Channel Diagnostics Distribution Method: End user. OEM, Third-party Price: \$671 Number Installed to Date: 1.000 -5.000 **Date First Installed:** September 1978

#### DIGITAL EQUIPMENT CORP. **DF01-A ACOUSTIC COUPLER Modern Class:** Coupler Transmission Technique: Asynchronous

Transmission Mode: Half-Duplex, Full-Duplex

Transmission Rate: Asynchronous -Interface: RS-232C, 20 MA Current Loop Transi nission Medium: Voice-Grade Price: \$345 Date First Installed: 1978 (See Vendor Profile Page V-10)

DIGITAL EQUIPMENT CORP. DE02-AA/AC Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C, CCITT V.24. CCITT V 28 Bell-Compatible: 103 Transmission Medium: Voice-Grade

Features: Autoanswer, Alternate Voice/Data, Diagnostics Price: \$450 to \$650 **Date First Installed: 1980** 

DIGITAL EQUIPMENT CORP. DF03-AA/AC Modern Class: Long-Haul

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex namission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bos Interface: RS-232C, CCITT V.24. Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics, Switchahle Date Rates Price: \$895 to \$1 095 Date First Installed: 1980

DIGITAL EQUIPMENT CORP. DF03-RA/RC Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, CCITT V.24, CCITT V.28. RS432-A Bell-Competible: 103, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Diagnostics Price: \$750 to \$950 Date First installed: 1983

DURACOM CORP. Modern Class: Short-Haul Transmission Technique: Asynchronous

Transmission Mode: Full-Duplex 9.600 bos Interface: RS-232C Transmission Medium: Solid Copper Wire Pair

Transmission Rate: Asynchronous -

Diagnostics: No Features: High Noise Immunity Distribution Method: End user Price: \$99 to \$104 Number installed to Date: 3,000 Date First installed: 1977 (See Vendor Profile Page V-11)

#### DYNATECH DATA SYSTEMS

ME-1 Modern Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14.400 bos Interface: RS-232C, CCITT V.24 Transmission Medium: Digital Links Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$440 ber Installed to Date: 500 -1.000 (See Vendor Profile Page V-11)

DYNATECH DATA SYSTEMS Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bos. 1.800 bos. 2.400 bos. 4.800 bps, 9,600 bps, 14,400 bps interface: RS-232C, CCITT V.24 Transmission Medium: Metallic Twisted Pairs Diagnostics: No atures: Switchable Data Rates Distribution Method: End user. Third-party Price: \$275 Number Installed to Date: 500 -1.000 Date First Installed: 1980

#### DYNATECH DATA SYSTEMS

LDM 22 Modern Class: Short-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Transmission Medium: Metallic Twisted Pair Features: Switchable Data Rales Distribution Method: End user. Third-party Price: \$440 Number Installed to Date: 1,000 -5,000 Date First Installed: 1982

#### DYNATECH DATA SYSTEMS **LDM 32**

Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous - 2,400 bps, 4,800 bps, 4,800 bps, 4,800 bps, 9,800 the interface: RS-232C, CCITT V.24
Transmission Medium: Two Unload Twisted-Pair
Disgnostice: No
Features: Switchable Data Rates,
Remote Digital Loopback
Distribution Method: End user,
Third-parry
Price: \$590
Number Installed to Date: Under 100
Date First Installed: 1982

RIMTROL SYSTEMS, INC.
LYNX 103-0AA
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Make: Asynchronous
300 bps
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Festures: Autoclal, Autoanswer
Distribution Method: Third-party
Price: \$299
(See Vendor Profile Page V-11)

EMTROL SYSTEMS, INC.
LYNX 103-0A4 (APPLE LYNX)
Modem Clasa: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 300 bps
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Linea
Diagnostics: No
Features: Autoclial, Autoanswer
Distribution Method: Third-party
Price: \$299

ENVAX CORP. ACOUSTIC COUPLER N78 Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Dunley Transmission Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 103
Transmission Medium: Voice-Grade Lines Distribution Method: Third-party Price: \$195 to \$225 Number Installed to Date: 10.000 -50.000 Date First Installed: 1979 (See Vendor Profile Page V-11)

ENVAX CORP.
103-1
103-1
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Frill-Duplex
Transmission Rate: Asynchronous 300 bps

Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diegnostics: Yes; Add-on Features: Autoanswer, Alternate Voice/Data, Diegnostics Distribution Method: OEM Price: \$175 to \$485 Date First Installed: 1979

ENVAX CORF.
103-2
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duptex,
Full-Duptex
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lign
Diagnostics: Vest, Add-on
Peatures: Autoanswer, Alternate
Voice/Data, Diagnostics
Diatribution Methods: OEM
Price: \$175 to \$485
Dale First Installed: 1979

103-3
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C
Belf-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Degnostics: Yes; Add-on

ENVAX CORP.

Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: OEM Price: \$175 to \$485 Date First Installed: 1979

103-5
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Bell-Competible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Add-on
Features: Autoanswer, Alternate
Voice/Data, Diagnostics
Distribution Method: OEM

Price: \$175 to \$485

Date First Installed: 1979

ERICSON PROGMATIC, INC, 2AT 1200 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Moder Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps; Asynchronous

Synchronous - 600 bps. 1,200 bps interface: CCITT V.22
Transmission Medium: Voice-Grad Lines
Diagnostica: Yes; Built-in
Features: Autoequalizer, Automates Voice/Data, Diagnostica, Fallback, Switchable Data Rates
Distribution Method: End user Price: \$950
Number Installed to Date: Under 100
Date First Installed: January 1980
(See Vendor Profile Page V-11)

ERICSON PROGMATIC, INC.

ZAT 2400 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps interface: CCITT V.22 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Festures: Autoequelizer. Autoanswer, Alternate Voice/Data, Reverse Channel, Fallback Switchable Data Rates, Point to Point and Multidropping Distribution Method: End user Price: \$925 Number Installed to Date: Under 100

Date First Installed: January 1980

ERICSON PROGMATIC, INC.

Modern Class: Long-Haul

**ZAT 4800** 

Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 Interface: CCITT V.27 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Fallback, Switchable Data Rates. Dial Backup Distribution Method: End user Price: \$1,895 Number Installed to Date: Under 100

ERICSON PROGMATIC, INC.
ZAT 9800
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous110 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps, 2,400 bps, 4,800
bps, 9,600 bps
Litterface: CCITT V 29

Date First Installed: January 1980

Transmission Medium: Voice-Grade Lines Disgnostics: Yes; Built-in Feetures: Autosqualizer, Autonayeer, Reverse Channel, Disgnostics, Faliback, Switchable Data Rates, Mutiplexer Option Distribution Method: End user Price: \$2.195 Number Installed to Date: Under 100 Date First Installed: January 1980 Date First Installed: January 1980

FIBRONICS INTERNATIONAL,

FM 801

Modern Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Moder Full-Duplex Transmission Rate: Asynchronous -4,800 bps: Synchronous -14,400 bps: September 14,400 bps: September 14,400 bps: September 14,400 brand 14,400 Interface: September 14,400 Beatures: Autooqualizer, Autonswer, Reverse Channel, Switchable Data Rates Disgristics, Clock Calendar, Switchable Data Rates

(See Vendor Profile Page V-12)

FIBRONICS INTERNATIONAL, INC.
INC.
Modem Class: Fiber-Optic
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Refet: Asynchronous/
Synchronous - 296K bps
Interface: RS-292C
Transmission Medium: Fiber Optics
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoanswer, Reverse Charnel,
Diagnostics, Clock Calendar,
Swirchalbe Data Rates
Distribution Method: End user

FRIEDMAN ASSOCIATES
NEC 201
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous
-2,400 bps
Interface: RS-232C
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Distribution Method: End user
Price: \$620
Date First Installed: January 1981
(See Vendor Profile Page V-12)

FRIEDMAN ASSOCIATES
NEC 201 CR
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 2,400 bps

Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autodial Distribution Method: End user Price: \$645

Date First Installed: June 1981 FRIEDMAN ASSOCIATES

NEC 202T Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -1.800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics Distribution Method: End user Price: \$305 Date First Installed: June 1981

**FRIEDMAN ASSOCIATES** 

**NEC 212** Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -300 bos. 1,200 bos Interface: RS-232C Bell-Competible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial Distribution Method: End user Prine: \$500 Date First Installed: January 1981

FRIEDMAN ASSOCIATES **NEC 212 AR** 

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Tra alon Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -300 bps; Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 212 ission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autodial, Autoenswer Distribution Method: End user Price: \$500 Date First Installed: June 1982

**FRIEDMAN ASSOCIATES** NEC 212 RR Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps; Synchronous - 1,200 bps Interface: RS-232C Bell-Competible: 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial Distribution Method: End user Price: \$675 Date First Installed: January 1982

FRIEDMAN ASSOCIATES

NEC DSP 4800-U Modern Class: Long-Haul Transmission Technique: ansmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autosqualizer, Diagnostics, Multiport, Fallback Distribution Method: End user Price: \$950 Date First Installed: January 1982

**FRIEDMAN ASSOCIATES** 

NEC DSP 9600-U Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -4,800 bps, 7,200 bps, 9,600 bps interlace: RS-232C Transmission Madium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer Distribution Method: End user Price: \$1,500 Date First Installed: January 1982

FRIEDMAN ASSOCIATES **NEC VOICE DIGITIZER** Modem Class: Long-Haul Transmission Technique:

Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Price: \$7,000 Date First Installed: January 1984

FUJITSU AMERICA, INC. F-1915L

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4 800 bos Interface: RS-232C Transmission Medium: Voice-Grade Lines, Unconditional Voice-Grade Diagnostics: Yes: Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping Distribution Method: OEM Price: \$1,795 Number Installed to Date: 100 - 500 Date First Installed: November 1983 (See Vendor Profile Page V-12)

F-1921L Modem Class: Long-Haul Transmission Technique Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous 9,600 bos interface: RS-232C Transmission Medium: Unconditional Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoenswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping Distribution M. W DEM Price: \$2,450 Number Installed to Date: 100 - 500 Date First Installed: November 1983

FUJITSU AMERICA, INC.

FUJITSU AMERICA, INC. F-1925L Modern Class: Long-Haul

Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -19,200 bos Interface: RS-232C Transmission Medium: Unconditional Voice-Grade Diagnostics: Yes; Built-in Features: Autosqualizer, Autoanswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping ution Method: OEM Price: \$6,000 Number Installed to Date: 100 - 500 Date First Installed: November 1983

**FUJITSU AMERICA, INC.** M-1915CM06 Modern Class: Long-Haul Transmission Technique: Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4.800 bos Interface: TTL Transmission Medium: Unconditional Voice-Grade Diagnostics: Yes; Add-on Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping **Distribution Method: OEM** Price: \$395 Number Installed to Date: 5,000 Date First Installed: November 1983

FILITSU AMERICA, INC. M-1921CM08 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -

9,600 bps

Interface: TTL

Transmission Medium: Unconditional Voice-Grade Diagnostics: Yes; Add-on
Features: Autoequalizer,
Autoenswer, Diagnostics, Multiport,
Fallback, Switchable Data Rates, Software Strapping

Distribution Mathod: OEM Price: \$595 Number Installed to Date: 100 - 500 Date First Installed: November 1983

FUJITSU AMERICA, INC. M-1925CM02 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -19 200 bos Interface: TTL Unconditional Voice-Grade Diagnostics: Yes; Add-on Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping Distribution Method: OEM Price: \$1,200 Number installed to Date: 100 - 500 Date First Installed: November 1983

**FUJITSU AMERICA, INC.** M-1925CM03 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -19,200 bps Interface: TTL Transmission Medium: Unconditional Voice-Grade Diagnostics: Yes; Add-on Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Software Strapping Distribution Method: OEM Price: \$1,500 Number Installed to Date: 100 - 500 Date First Installed: November 1983

GANDALF DATA, INC. EA1

Modern Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -100K bps Interface: RS-232C, CCITT V.24. CCITT V 28 Transmission Medium: Fiber Optics Diagnostica: No Features: Switchable Data Rates Distribution Method: End user Price: \$500 (See Vendor Profile Page V-12)

GANDALF DATA, INC. FS1

Modem Class: Fiber-Optic Transmission Techniqu Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous -Up to 252,000 bps interface: RS-232C, CCITT V.24, V.28 Transmission Medium: Fiber Optics Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$600 alled to Date: Under 100

QANDALF DATA, INC. LDS 100C Modern Class: Line Driver

Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -14,400 bps Interface: RS-232C, CCITT V.24.

CCITT V.28 Transmission Medium: Narrow-**Band Lines** Diagnostics: No Distribution Method: End user

Price: \$225 er installed to Date: 5,000 -10,000 Date First installed: 1974

GANDALF DATA, INC.

LDS 101 Modern Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -14.400 bos Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Narrow-Band Lines Diagnostics: No Distribution Method: End user Price: \$400 Number Installed to Date: 5,000 -10,000

Date First Installed: 1974 **GANDALF DATA, INC.** 

**SAM 201** Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Date First Installed: 1982

GANDALF DATA, INC.

**SAM 212A** Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer,

Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user

GANDALF DATA, INC. Modern Class: Long-Haul Transmission Techn

Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9,600 bps Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Multiport, Manual Dial Backup Distribution Method: End user Price: \$2,800

Date First Installed: 1981

GANDALF DATA, INC. ME 2D Modern Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bp 14,400 bps, 19,200 bps, 56,000 bps; Synchronous - 316,800 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Narrow-Band Lines Distribution Method: End user

Price: \$400 Date First Installed: 1979

GANDALF DATA, INC. Modern Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps: Asynchronous/Synchronous -38.4K bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Narrow-Band Lines

Diagnostics: No Distribution Method: End user Price: \$450 Date First Installed: 1978

GANDALF DATA, INC. RADIO MODEM dem Class: Radio Frequency

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 1,200 bps, 2,400 bps

Interface: RS-232C, CCITT V.24,

Transmission Medium: Radio Links

CCITT V 28

GANDALF DATA, INC. LDS 309; RM 3309 Modern Class: Short-Haul

Diagnostics: No Price: \$1,595 Date First Installed: 1983

GANDALF DATA, INC. LDS 120: RM 3120 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duniex. Full-Duplex sion Rate: Asynchronous -9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.28 **Band Lines** Diagnostics: No Features: Digital Loopback Distribution Method: End user Price: \$300 Number installed to Date: 10,000 -

Date First Installed: 1973 GANDALF DATA, INC. LDS 121

50,000

Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex ission Rate: Asynchronous -9,600 bps interface: RS-232C, CCITT V.24. Transmission Medium: Narrow-**Band Lines** Diagnostics: No Distribution Method: End user

GANDALF DATA, INC. LDS 140; RM 3140 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex ission Rate: Asynchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Narrow-

Band Lines Distribution Method: End user Price: \$450 Number Installed to Date: 500 -1 000 Date First Installed: 1977

GANDALF DATA, INC. LDS 260 Modern Class: Short-Haul Transmission Technique: Transmission Mode: Full-Duplex Transmission Rate: Synchronous -56,000 bps; Asynchronous/ Synchronous - 50K bps Interface: RS-232C, RS-422, CCITT V.24, CCITT V.28, MIL 188C, V.35 mission Medium: Narrow-Band Lines Price: \$786 to \$886 Date First Installed: 1982

ion Technique: Synchronous Transmission Mode: Half-Duplex, lesion Rate: Synchronous -14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Narrow-Band Lines Diagnostics: No Features: Multiport, Analog Loopback Distribution Method: End user Price: \$450 nber installed to Date: 5,000 -10.000

Date First installed: 1974 GANDALF DATA, INC. LDS 319; RM 3119 Modern Class: Short-Haul Transmission Technique: Asynchronous, Synchronous namission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Narrow-Band Lines Diagnostics: No Features: Switchable Data Rates Distribution Method: End user Price: \$735 Number installed to Date: 500 -

GANDALF DATA, INC. LDS 329; RM 3329 Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, Transmission Medium: Narrow-**Band Lines** Diagnostics: No Distribution Method: End user Price: \$450 Number Installed to Date: 500 -1,000 Date First Installed: 1979

Date First Installed: 1978

1.000

GANDALE DATA, INC. SM LDS 349 Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Interface: RS-232C, CCITT V.24 Transmission Medium: Twisted-pair Features: Autoequalizer Distribution Method: End user Price: \$295 Number Installed to Date: Under 500 Date First Installed: January 1984

GANDALF DATA, INC. LINE MISER Modem Class: Short-Haul Transmission Technique:
Asynchronous, Synchronous
Transmission Rete: Asynchronous/
Synchronous - 9,000 bps
Interface: FS-232C
Transmission Rete: Voice-Grade
Lines, Narrow-Bend Lines
Disgnostics: No
Disgnostics: No
Disgnostics: Septiment Reterior
Disgnostics: No
Disgnostics: Septiment Reterior
Disgnostics: No
Disgnost

GANDALF DATA, INC.
MINI LDS 122
Modern Class: Short-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Ful-Duplex
Transmission Rate: Asynchronous 9,600 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: NarrowBand Lines
Disgnostics: No
Feetures: No
Feetures: Autoqualizer

Distribution Method: End user

GANDALF DATA, INC. LDM 404; RM 3404 Modern Class: Medium Distance Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Voice-Grade Lines Features: Multiport, Split Channel Distribution Method: End user Price: \$875 to \$975 Number installed to Date: 500 -1.000 Date First Installed: 1977

GANDALF DATA, INC. LDM 409 Modern Class: Medium Distance Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9,600 bos Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines, Narrow-Band Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics Distribution Method: End user Date First Installed: 1983

Dete First Installed: 1983
GANDALF DATA, INC.
LDM 414; RM 3414
Modem Class: Medium Distance
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous2,400 bps, 4,800 bps
Interlace: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines.
Transmission Medium: Voice-Grade
Lines.
975 to \$1,050

Number Installed to Date: 500 -1,000 GANDALF DATA, INC.

LDM 444; RM 3444
Modem Cleas: Medium Distance
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous
4,800 bps
Interface: R3-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Narrow-Band Lines
Diagnostics: Yes; Built-in
Features: 8,5 msec Fast Pul
Instribution Method: End user
Price: \$1,350
Date First installed: 1982

DANDALE DATA, INC. LDM 454; RM 3454 Modern Class: Medium Distance Transmission Technique: Asynchronous namission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -4.800 bos Interface: RS-232C, CCITT V.24, CCITT V.28 mission Medium: Narrow-**Band Lines** Diagnostics: Yes; Built-in Distribution Method: End user Price: \$1 495 Date First Installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. GDC 500A/58K Modern Class: Digital (DSU) Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -56,000 bps Interface: CCITT V.35 Transmission Medium: Digital Links Diagnostics: Yes; Add-on Feetures: Autoequalizer Diagnostics Distribution Method: End user, Price: \$995 Number Installed to Date: 200 Date First Installed: 1983 (See Vendor Profile Page V-12)

GENERAL DATA COMM
IMOUSTRIES, INC.
DDC GSU-SON,
Modern Class: Digital (DSU)
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
2,400 bps, 4,800 bps, 8,600 bps
Interface: RS-232C
Transmission Medium: Digital Links
Diagnostics: Yes; Built-in
Features: Autocqualizer,
Diagnostics, Synthobable Data Rates
Diatribution Method: End user.
Third-party
Price: \$695

Number installed to Date: 200 Date First Installed: 1983

GENERAL DATACOMM
INDUSTRIES, INC.
GSU-5008
Modern Class: Digital (DSU)
Transmission Technique:
Synchronous
Transmission Rate: Synchronous 2,400 bps, 4,800 bps, 9,800 bps
Interface: RS-232C
Transmission Medium: Digital Links
Disgnostics: Yes; Built-In
Features: Diagnostics, Switchable
Data Rates
Distribution Method: End user,
Third-party

GENERAL DATACOMM

INDUSTRIES, INC.
DC 103.
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No

Features: Autoanswer, Alternate

Voice/Data, Diagnostics Distribution Method: End user Date First Installed: 1981

GENERAL DATACOMMI INDUSTRIES, INC. DC 108-3M Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 108 Transmission Medium: Voice-Grade

Bell-Compatible: 108 Transmission Medium: Voice-C Lines Diagnostics: Yes; Add-on Features: Diagnostics Distribution Method: End user Date First Installed: 1981

**GENERAL DATACOMM** 

INDUSTRIES, INC.
DC 201-7
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Dupiex,
Fulf-Dupiex
Transmission Rate: Synchronous
1,200 bps. 2,400 bps
Interface: RS-232C. CCTT V.24,
CCTTT V.26, CCTTT V.29
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Add-on
Features: Diagnostics; Failback,
Switchable Data Rates, Remote

Distribution Method: End user

Diagnostics

Price: \$675 Number Installed to Date: 5,000 Date First Installed: 1981

INDUSTRIES, INC. DC 201C Modern Class: Long-Haul Transmission Technique: Synchronous mission Mode: Half-Duplex, Full-Dunley Transmission Rate: Synchronous -2,400 bos Interface: RS-232C, CCITT V.24. CCITT V.26, CCITT V.28 Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Add-on Features: Autodial, Autoanswer Alternate Voice/Data, Diagnostics Distribution Method: End user Date First Installed: 1980

GENERAL DATACOMM INDUSTRIES, INC. DC 201C-K Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -300 bps, 600 bps, 1,800 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V.26, CCITT V.28 Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autodial, Autoanswer,

Bell-Compatible: 201
Transmission Medium: Voice-Gra
Lines
Diagnostics: No
Features: Autodial,
Autoanswer,
Atternate Voice/Data, Diagnostics,
Faliback, Switchable Data Rates,
Sarial Autodial
Distribution Method: End user
Price: \$750
Date First Installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. DC 202S/T Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duniex Full-Duplex Transmission Rate: Asynchronous -1,200 bps, 1,800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user. Third-party Price: \$405 Number Installed to Date: 2,500 Date First Installed: 1980

GENERAL DATACOMM INDUSTRIES, IMC. DC 2088/A Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Bell-Competible: 208
Transmission Medium: Voice-Grade Lines tiles: Yes: Add-on Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data. Diagnostics

tribution Mathod: End user

Number Installed to Date: 4,000 Date First Installed: 1981 **GENERAL DATACOMM** INDUSTRIES, INC.

Price: \$1,595

DC 212A Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Bell-Competible: 103, 212 Transmission Medium: Voice-Grade Lines

Nes: Yes: Add-on Features: Autodial, Autosqualizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$840 Number Installed to Date: 500 Date First Installed: 1982

**GENERAL DATACOMM** INDUSTRIES, INC. DC 2400ASM Modern Class: Long-Haul

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps; Asynchronous/ Synchronous - 2,400 bps erface: RS-232C, CCITT V.24, CCITT V.26, CCITT V.28 Bell-Compatible: 201 Transmission Medium: Voice-Grade Diagnostics: Yes; Add-on

Features: Diagnostics, Fallback, Switchable Data Rates, Point to Point Distribution Method: End user.

Third-party Price: \$795 Number Installed to Date: 3,000 Date First Installed: 1981

GENERAL DATACOMM INDUSTRIES, INC. DC 4800

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous namission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -1,200 bps, 1,800 bps, 2,400 bps;

Asynchronous/Synchronous - 4,800 Interface: RS-232C, CCITT V.24. CCITT V 28 Bell-Compatible: 208
Transmission Medium: Voice-Grade

Lines
Diagnostics: Yes; Add-on
Features: Autoequalizer,
Diagnostics, Remote Diagnostics
Distribution Method: End user,

Price: \$1,475 Number installed to Date: 2,500 Date First installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. DC 4800S

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1,200 bps, 1,800 bps, 2,400 bps; Asynchronous/Synchronous - 4,800 bps

Interface: RS-232C CCITT V 24 CCITT V.28 Bell-Compatible: 208 Transmission Medium: Voice-Grade

Lines Diagnostics: No Features: Autodial, Autoequalizer, Autoenswer, Alternate Voice/Data, Diagnostics, Serial Autodial ribution Method: End user. Third-party Price: \$1,445 Number installed to Date: 500 Date First installed: 1983

GENERAL DATACOMM INDUSTRIES, INC.

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -600 bps, 1,200 bps, 1,800 bps; Asynchronous/Synchronous - 2,400 bps, 4,800 bps rface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Add-on Features: Autoequalizer,

Diagnostics, Fallback, Switchable Data Rates, Remote Diagnostics Date First Installed: 1982

**GENERAL DATACOMM** INDUSTRIES, INC.

DC 9600 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24, CCITT V.29

Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Add-on Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Bates Date First Installed: 1980

GENERAL DATACOMM INDUSTRIES, INC. DC 9600 EP Modern Class: Long-Haul

Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24. CCITT V.28, CCITT V.29 Transmission Medium: Voice-Grade Diagnostics: Yes; Add-on Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Rates, Point to Point

Distribution Method: End user. Third-party Price: \$2,730 Number Installed to Date: 500 Date First Installed: 1983

**GENERAL DATACOMM** INDUSTRIES, INC. DC 9600 QP Modern Class: Long-Haul

Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps

Interface: CCITT V.29 Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Fallback Distribution Method: End user, Third-party Price: \$2,995 Number installed to Date: 1,500 Date First installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. DC 9600 QPS

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4.800 bps, 9.600 bps: Asynchronous/Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24, CCITT V 28 CCITT V 29 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Add-on Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Rates, Multipoint Date First Installed: 1983

GENERAL DATACOMM INDUSTRIES, INC. GDC 103J-M dem Class: Long-Haul

Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps. 300 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Bell-Compatible: 103
Transmission Medium: Voice-Grade Lines Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user

> Date First Installed: 1981 GENERAL DATACOMM INDUSTRIES, INC.

Price: \$240

GDC 212 FD Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in

Features: Autodial, Autoequalizer, Diagnostics Distribution Method: End user, Third-party Price: \$535 Number Installed to Date: 200 Date First Installed: 1983

GENERAL DATACOMM INDUSTRIES, INC.

**GDC 21288** Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 110 bps, 300 bps, 1,200 bps Interface: RS-232C Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autodial, Autosqualizer, Autoanswer, Diagnostics Distribution Method: Third-party Price: \$435

Number Installed to Date: 200 Date First Installed: 1983

GENERAL DATACOMM INDUSTRIES, INC.

GDC 21255 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C, CCITT V.24, CCITT V.28

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

Diagnostics: No Features: Autoequalizer, Autoanswer, Alternate Voice/Data Diagnostics, Switchable Data Rates Distribution Method: End user Date First Installed: 1984 GENERAL DATACOMM INDUSTRIES, INC. GDC 2400 ED

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: R5-23C, CCITT V.24, CCITT V.28

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates, Serial Autodial Distribution Method: End user Date First Installed: 1984

GENERAL DATACOMM INDUSTRIES, INC. GDC 9804 WITH 4 CHANNEL MULTIPLEXER

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps; 9,600 bps; Asynchronous/Synchronous - 7,200

bps Interface: RS-232C, CCITT V.24, CCITT V.28, CCITT V.29 Transmission Medium: Voice-Grade Lines

Diagnostica: Yes; Add-on Features: Autoequalizer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Tail-End Controls Distribution Method: End user.

Third-party Price: \$3,195 Number installed to Date: 2,500 Date First Installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. DME-3

Modern Cliese: Modern Eliminator Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous - 1,200 bps. 2,400 bps. 4,800 bps. 9,600 bps. 14,400 bps. 1,600 bps. 14,400 bps. Interface: RS-232C Transmission Medium: 232 Cable Features: Switchable Data Rates, Master Trimin Source.

GENERAL DATACOMM INDUSTRIES, INC.

INDUSTRIES, INC.
DC 2020
Modern Cleas: Short-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 2,400 bps, 4,800 bps, 9,600 bps,
14,400 bps, 19,200 bps;
Asynchronous/Synchronous - 7,200

type
Transmission Medium: Nonload
Twisted Wire

Diagnostics: Yes: Built-in

Features: Autoequalizer, Diagnostics, Switchable Data Rates, Multidrop, Point to Point Distribution Method: End user, Third-party Price: \$660 Number Installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. DC 2030 Modern Class: Short-Haul

Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -56,000 bps; Asynchronous/ Synchronous - 64,000 bps

Interface: CCITT V.35
Transmission Medium: Nonload
Twisted Wire
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Diagnostics, Multidrop and Point to

Point Distribution Method: End user, Third-party Price: \$805

Number Installed to Date: 1,000 Date First Installed: 1983

GENERAL DATACOMM IMDUSTRIES, INC. GDC LCM 1010/1020 Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous Transmission, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,800 bps, 14,400 bps

Transmission Medium: Nonload Wire Line Features: Autoequalizer, Diagnostics, Multidrop and Point to

Distribution Method: End user, Third-party Price: \$295 to \$325 Number Installed to Date: 1,500 Date First Installed: 1982

GENERAL DATACOMM INDUSTRIES, INC. NMS-2020

Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,900 bps, 14,400 bps, 19,200 bps; Asynchronous/Synchronous - 7,200 bps

Interface: RS-232C Transmission Medium: Twisted-Pair Wire Line Diagnostics: Yes; Built-in

Features: Autoequalizer, Diagnostics, Switchable Data Rates, Supports Netcon Distribution Method: End user

GENERAL DATACOMM INDUSTRIES, INC. CSU-550A Modern Class: Channel Service Unit

Transmission Technique: Synchronous Transmission Mode: Full-Duple:

Transmission Mode: Full-Duplex Transmission Rate: Synchronous 1-400 pps, 4-800 pps, 9-600 pps, 56,000 pps Interface: SSL/CSU Transmission Medium: Digital Links Diagnostics: No Features: Switchable Data Rates, Terminated DBS Service

Distribution Method: End user, Third-party

GLENAYRE ELECTRONICS
GL. 1102 HF PULSE COMPRESSION
Modem Class: Radio Frequency

(RF)
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous 300 bps
Interface: RS-232C
Transmission Medium: Radio Links
Diagnostics: Yes; Built-in
Features: Autocial, Alternate
Voice/Data, Diagnostics, Fallback
Distribution Method: End user,
OEM. Third-party

Price: \$6,000 to \$8,000 Number installed to Date: Under 100 Date First installed: October 1983 (See Vendor Profile Page V-13)

GLEMAYRE ELECTRONICS GL 1142 HF MESSAGE TERMINAL Modem Class: Radio Frequency Transmission Technique: Synchronous Transmission Mode: Full-Duplex

Transmission Rate: Asynchronous/ Synchronous - 100 bps Interface: RS-232C Transmission Medium: Radio Links Diagnostics: Yes; Bullt-in Features: Autodial, Alternate Voice/Deta, Diagnostics, Fallback, Switchable Data Rates, Message Format

Distribution Method: End user, OEM, Third-party Price: \$6,000 to \$8,000 Number Installed to Date: 500 -1,000 Date First Installed: September

GTECH CORP. CM 7201A

1983

Modem Cleas: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1,800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Standard Lease Lines Diagnostics: No Distribution Method: End user Price: \$280 Number Installed to Date: Under 100 Date First Installed: September

(See Vendor Profile Page V-13)

GTECH CORP.
GSC 202
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
1,800 bps
Interface: TTL
Bell-Compatible: 202
Transmission Medium: Standard

Transmission Medium: Standard Lease Lines Diagnostics: Yes; Built-in Distribution Method: End user Number installed to Date: 500 -1,000

Date First Installed: May 1982

HAYES MICROCOMPUTER PRODUCTS, INC. MICROMODEM IIE Modem Class: Long-Haul Transmission Technique:

Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous -

110 bps, 300 bps Interface: Internal Apple Bus Bell-Compatible: 103 Transmission Medium: Voice-Grade

Lines
Diagnostics: No
Features: Autodial, Autoanswer,
Switchable Data Rates
Distribution Method: Third-party

Price: \$329

Date First Installed: October 1983
(See Vendor Profile Page V-14)

HAYES MICROCOMPUTER PRODUCTS, INC. MICROMODEM 100

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -

110 bps, 300 bps Interface: S100 Bus Bell-Compatible: 103 Transmission Medium: Voice-Grade

Lines
Diagnostics: No
Features: Autodial, Autoanswer,
Switchable Data Rates, Pulse/Line
Dial Only
Distribution Method: Third-party
Price: \$399

Date First Installed: 1977

MAYES MICROCOMPUTER
PRODUCTS, INC.

SMARTMODEM 300
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Asynchronous110 bps, 300 bps
Interface: Rs-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Autodial, Switchable Data

Distribution Method: Third-party Price: \$289 Date First Installed: July 1981

HAVES MICROCOMPUTER PRODUCTS, INC. SMARTMODEM 1200 Modern Class: Long-Haul Transmission Technique: Asynchronous mission Mode: Half-Duplex, Full-Duplex
Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autodial, Switchable Data Rates

**Date First Installed: September** HAYES MICROCOMPUTER DOUCTS, INC. SMARTMODEM 1200B Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: IBM PC Bus

Distribution Method: Third-party

Price: \$699

Lines Diagnostics: No Features: Autodial Distribution Method: Third-party Price: \$599 Date First Installed: May 1983

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade

HONEYWELL, INC. DCD8710 Modem Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -9.600 bos Interface: RS-232C, CCITT V.24, 20 MA Current Loop
Transmission Medium: Nonload Metallic Pairs Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics Distribution Method: End user,

(See Vendor Profile Page V-14) HONEYWELL, INC. DCD8720 Modem Class: Line Driver Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -19,200 bps Transmission Medium: Nonload Metallic Pairs Diagnostics: Yes; Built-in Features: Autoequalizer.

Distribution Method: End user, Price: \$505

HONEYWELL, INC. Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1,200 bps, 1,800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-grade Diagnostics: Yes; Built-in Features: Alternate Voice/Data, Autoequalizer, Diagnostics Distribution Method: End user

Price: \$495 HONEYWELL, INC. DCD2011 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Synchronous -2,400 bps Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-grade

Third-party

Diagnostics: Yes; built-in Features: Alternate Voice/Data. Automatic Answering, Diagnostics Distribution Method: End user, Price: \$995 HONEYWELL, INC.

DCD2012 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2 400 hns Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-grade l ines Diagnostics: Yes: built-in

Features: Alternate Voice/Data, Automatic Answering, Diagnostics Distribution Method: End user. Third-party Price: \$895

HONEYWELL, INC. DCD2021 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Rate: Asynchronous -1.800 bos Bell-Compatible: 202 Transmission Medium: Voice-grade Lines Diagnostics: Yes; built-in Features: Automatic Answering,

Distribution Method: End user, Third-party

HONEYWELL, INC. DCD2021 Modem Class: Long-Haul

Transmission Technique: Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps; Asynchronous/ Synchronous - 1,200 bps Bell-Compatible: 103, 212
Transmission Medium: Voice-grade

Lines Diagnostics: Yes; built-in Features: Diagnostics
Distribution Method: End user, Third-party Price: \$895

HONEYWELL, INC. DCD2121 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex Full-Duplex

Transmission Rate: Asynchronous -300 bps; Asynchronous Synchronous - 1,200 bps Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-grade Lines

Diagnostics: Yes; built-in

Features: Alternate Voice/Data, Autoanswer, Diagnostics

Distribution Method: End user, Third-party Price: \$800

MODEL 3863-1 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport. Switchable Data Rates Distribution Method: End user Price: \$2.685 Date First Installed: March 1980 (See Vendor Profile Page V-14)

MODEL 3863-2 Modem Class: Long-Haul Transmission Technique:

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Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex
Transmission Rate: Synchronous
1,200 bps, 2,400 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoenswer, Diagnostics, Switchable
Data Rates, Antistreaming
Distribution Method: End user
Price: 82,935

MODEL 3864-1 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24. CCITT V.27, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Antistreaming Distribution Method: End user Price: \$3,715 Date First Installed: March 1980

MODEL 3884-2 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex Transmission Rate: Synchronous -2 400 bps 4 800 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Switchable Data Rates, Antistreaming Distribution Method: End user Price: \$3 925 Date First Installed: March 1980

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Switchable Data Rates, Antistreaming Distribution Method: End user Price: \$5,885 Date First Installed: June 1980

MODEL 3865 MODEL 1&2

RACK-MOUNTED MCDEM 3868 MODEL 1 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Transmission Rate: Synchronous -1 200 hps. 2 400 hps. Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer. Diagnostics, Multiport, Switchable Data Rates, Antistreaming Distribution Method: End user

Price: \$2,550 to \$5,000

RACK-MOUNTED MODEM 3868 MODEL 2 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autoequalizer, Diagnostics, Multiport, Switchable Data Rates Antistreaming Distribution Method: End user Price: \$2 550 to \$5,000

IBM
RACK-MOUNTED MODEM 3866
MODEL 3
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Mode: Hall-Duplex
A 800 bps, 9,600 bps
Interface: RS-232C, CGTT V.24
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Featurers: Autosqualizer,
Diagnostics, Multiport, Switchable
Data Rates, Antistreaming
Distribution Method: End user
Price: \$2,550 to \$5,000

RACK-MOUNTED MODEM 3868-MODEL 4 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer. Diagnostics, Multiport, Switchable Data Rates, Antistreaming

Distribution Method: End user Price: \$2,550 to \$5,000 IDE ASSOCIATES, INC.

IDEACOMM 1,200 Modern Class: Long-Haul

Transmisation Technique:
Asynchronous
Transmisation Mode: Full-Duplex
Transmisation Rate: Asynchronous
-300 bpe, 1,200 bps
Interface: RS-232C
Bell-Compatible: 103, 212A
Transmisation Medium: Volco-Grade
Lines
Diagnostics: Yes; Built-In
Features: Autoclaif, Autonaswer,
Alternate Volce/Data, Diagnostics,
Switchabib Data Rates
Distribution Method: Third-party
Price: \$545
Number Installed to Date: 100 - 500
Date First Installed: September
1983
(See Vendor Profile Page V-00)

Modem Cleas: Long-Haul
Transmission Moder: Full-Duplex
Transmission Rete: Synchronous
9,600 bps, 19,200 bps;
Asynchronous-9,500 bps;
Asynchronous-9,500 bps;
Interface: RS-232C
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autoscusticer,
Diagnostics, Muliport, Fallback,
Switchable Data Rates, Dial Backup
Distribution Method: End user

NCM 14.4

(See Vendor Profile Page V-17) INFINET, INC. NCM 1200 Modern Class: Long-Haul Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Reverse Channel, **Diagnostics** Distribution Method: End user Price: \$1,200 per installed to Date: 1,000 -5,000

INFINET, INC.
INCI 2400
Modem Class: Long-Haul
Transmission Made: Full-Duplex
Transmission Rate: Synchronous
1,200 bps: Asynchronous/
Synchronous-2,400 bps
Interface: CCITT V.26
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Reverse Channal,
Diagnostics: Faliback, Switchable
Data Rates
Distribution Method: End user
Price: \$1,400
Number Installed to Date: 5,000 10,000

INFINET, INC.

NCM 4800
Modem Class: Long-Haul
Transmission Mode Full-Duplex
Transmission Refe: Synchronous
2,400 bps; Asynchronous/
Synchronous - 4,800 bps
Interface: CCITT Viole-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Switchalab Data Rates
Distribution Method: End user
Price: \$2,400
Number installed to Date: 1,000 5,000

INTERTEL, INC.
NCM 9600
Modem Cless: Lóng-Haul
Transmission Modes: Full-Duplex
Transmission Medes: Full-Duplex
Transmission Rete: Synchronous 4,800 bps, 9,600 bps;
Asynchronous/Synchronous - 7200
Interface: CCITT V.29
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-InFeatures: Autoequalizer, Reverse
Channel, Diagnostics, Multiport,
Fallback, Switchable Data Rates
Distribution Method: End user
Price: \$4,300
Number Installed to Date: 1,000 5,000

INFOTRON SYSTEMS CORP.
LD 210/AS
Modem Class: Line Driver
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
14,400 bps
Interface: RS-232C, CCITT V.24
Bell-Compatible: 43401
Transmission Medium: Unload
Metallic Pairs
Festures: A/D Loopback
Price: \$210
Date First Installed: September
1981
(See Vendor Profile Page V-15)

INFOTRON SYSTEMS CORP.
LD 210/SA
Modem Cless: Line Driver
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous2,400 bps, 4,800 bps, 9,800 bps,
14,400 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Bell-Compatible: 43401
Transmission Medium: Unload
Metalia: Pairs
Price: \$350
Date First Installed: September
1981

INFOTHON SYSTEMS CORP. DL 96/V.29 Modem Class: Long-Haui Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous - 4,800 bps; 9,800 bps; Asynchronous/Synchronous - 7,200 bps interface: CCITT V.29 interface: CCITT V.29 Transmission Medium: Voice-Gradé Lines Features: Autoequalizer, Alternate Voice/Data

Date First Installed: 1981

INFOTRON SYSTEMS CORP.
DI. 2016
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Medie: Full-Duplex
Interface: R9-232C, CCITT V.24
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Features: Loopback
Priot: \$350
Date First Installed: 1982
INFOTROM SYSTEMS CORP.
D. 18600/V.2 RSM

IMPOTROM SYSTEMS CORP.
DL 9500/V.29 BSM
Modern Clasa: Long-Haul
Transmission Technique:
Synchronous
Transmission Refe: Synchronous 4,800 bps; 9,800 bps;
Asynchronous/Synchronous - 7,200
bps
Interface: RS-232C, CCITT V.24,
CCITT V.29
Transmission Medium: Voice-Grade
Lines
Price: \$5,500
IMPOTROM SYSTEMS CORP.

DSM 201C Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps

Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Price: \$925
INFOTRON SYSTEMS CORP.

DSM 2128
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 1,200 bps
Belf-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Price: \$750

INTEGRATED DESIGN ENGINEERING, INC. IDE-300

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -

300 bps. 1,200 bps Interface: NCR DMS Bus Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autocial, Autocanswer, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$500 Number Installed to Date: Under 500 Date First Installed: September 1983

(See Vendor Profile Page V-16)

INTERACTIVE SYSTEMS/JM
MODEL S20 AUDIO MODEM
Modern Class: Radio Frequency
Transmission Modes: Full-Duplex
interface: BELL 3002
Transmission Medium: CATV 75
OHM Cable
Diagnostics: No
Distribution Method: End user
Price: \$870
Number Installed to Date: Under
100
Date First Installed: 1977

(See Vendor Profile Page V-16)
INTERACTIVE SYSTEMS/3M
MODEL 720 DATA & CONTROL
MODEM
Modem Class: Radio Frequency
Transmission Technique:

Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous9,600 bps
Interface: 10 Bit Analog Data
Transmission Medium: CATV 75
Ohm Cable

Diagnostics: Yes; Built-in Features: Analog Loopback Distribution Method: End user Price: \$1,390 to \$1,490 Number installed to Date: 100 - 500 Date First installed: 1982

INTERACTIVE SYSTEMS/3M MODEL 920 DATA MODEM Modem Class: Radio Frequency (RF)

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 1,800 bps, 10,000 bps: Asynchronous/Synchronous -600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C. F Connector Transmission Medium: CATV 75 Ohm Cable Features: Analog Loopback Distribution Method: End user Price: \$890 Number installed to Date: 500 -1.000 Date First Installed: 1979

INTERACTIVE SYSTEMS/3M MODEL 925 DATA MODEM Modem Class: Radio Frequency Transmission Technique: Asynchronous

Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous - 110 bps, 300 bps, 2,400 bps, 2,400 bps, 2,400 bps, 4,900 bps, 4,900 bps interface: RS-232C, F Connector Transmission Medium: CATV 75 Ohm Cable Diagnostica: Yes; Built-in Features: Analog Loopback Distribution Method: End user Price: \$590 Number Installed to Date: 1,000 - 5,000 Date First Installed: 1982

INTERACTIVE SYSTEMS/3M MODEL 960 DATA MODEM Modem Class: Radio Frequency Transmission Technique Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,800 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps. 14,400 bps. 76,800 bps Interface: RS-232C Transmission Medium: CATV 75 Ohm Cable Diagnostics: Yes; Built-in Features: Analog Loopback Distribution Method: End user Price: \$980 Number Installed to Date: 100 - 500 Date First Installed: 1978

INTERACTIVE SYSTEMS/3M MODEL 965 DATA MODEM Modern Class: Radio Frequency mission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps, 1,800 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps. 14,400 bps. 76,800 bps Interface: CCITT V.35 Transmission Medium: CATV 75 Ohm Cable Disgnostics: Yes: Built-in Features: Analog Loopback Distribution Method: End user Price: \$1.190 Number installed to Date: 100 - 500 Date First installed: 1982

INTERBUSINESS CORP.
212A
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 1,200 bps
Interface: RS-232C
Bell-Compatible: 103, 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yps, Built-InFeatures: Autodial

Distribution Method: Third-party Price: \$595 Number Installed to Date: 1,000-5,000 Date First Installed: December 1980 (See Vendor Profile Page V-16)

INTERBUSINESS CORP.
A 1200
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
110 pps, 300 bps, 1,200 bps
Interface: RS-232C
Bell-Compatible: 103, 212
Transmission Medium: Voice-Grade
Lites
Lites

Interface: RS-232C Bell-Compatible: 103, 212 Transmisation Medium: Voice-Grad Lines Diagnostica: Yes; Bullt-in Features: Autocqualizer, Autonaswer, Diagnostics Distribution Method: Third-party Price: \$499 Number Installed: to Date: 500 -1,000 Date First Installed: August 1981

INTERBUSINESS CORP.
AC 300
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 110 bps, 300 bps
Interface: RS-232C
Bell-Competible: 103, 113
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoanswer, Diagnostics

Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics Distribution Method: Third-party Price: \$189 Number Installed to Date: 1,000 -5,000 Data First Installed: October 1980

INTERBUSINESS CORP. AUTO DIAL 212A Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$599 mber installed to Date: 1,000 -5.000

INTERBUSINESS CORP. M1200 Modem Class: Long-Haul Transmission Technique: Asynchronous

Date First Installed: October 1981

Transmission Mode: Half-Dunley Full-Duplex ission Rate: Asynchronous -110 bps. 300 bps. 1,200 bps Interlece: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade l ines Disgnostics: Yes: Bullt-in Feetures: Autoequalizer, Switchable

Data Rates Distribution Method: Third-party Price: \$449 Number installed to Date: 1,000 -E 000 Date First Installed: August 1981

INTERBUSINESS CORP. OEM

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Made: Half-Dunley Full-Dunlex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Feetures: Autodial Autoanswer. Fallback Distribution Method: Third-party Number installed to Date: 1,000 -

Date First Installed: May 1983

5.000

INTERBUSINESS CORP. 8-100 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade 1 ines Disgnostics: Yes: Built-in

Features: Autodial, Autoanswer, Fallback Distribution Method: Third-party Price: \$449 Number installed to Date: 100 - 500 Date First installed: May 1983

INTERBUSINESS CORP. STARCOM Modern Class: Long-Haul Transmission Technique: Asynchronous

Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Fallback

Distribution Method: Third-party Price: \$449 Number installed to Date: 5,000 -

10.000

Date First installed: October 1981

INTERDUSINESS CORP. 100 RA Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps. 9.600 bps. 14.400 bps. 19.200 bps, 56,000 bps Interface: RS-232C

Bell-Compatible: 43401 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Multiport Distribution Method: Third-party Price: \$235 Number Installed to Date: 500 -1 000 Date First Installed: January 1982

INTERBUSINESS CORP. 200

Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps Interface: RS-232C Bell-Compatible: 43401 Features: Multiport

Distribution Method: Third-party Price: \$495 Number Installed to Date: 100 - 500 Date First Installed: December 1983

INTERACIONS CLUSTER MODEM EMULATORS CME-1R Modern Class: Modern Eliminator Transmission Technique: Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Synchronous 2,400 bps, 4,800 bps, 9,600 bps, 14 400 hns Interface: RS-232C, CCITT V.24.

**Diagnostics:** No Features: Switchable Data Rates Distribution Method: Third-party Price: \$875

**Humber Installed to Date: Under** 100 Date First Installed: February 1983 (See Vendor Profile Page V-16)

INTERALINK ME-1R Modern Class: Modern Eliminator Transmission Technique: Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Synchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28

Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates, RTS to CTS Delays Distribution Method: Third-party Price: \$250

Number Installed to Date: 100 - 500 Date First Installed: 1982

Modern Class: Short-Haul Transmission Technique Asynchronous, Synchronous.

Isochronous Transmission Mode: Full-Dupley Transmission Rate: Asynchronous/ Synchronous - 110 bos, 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28

Transmission Medium: Voice-Grade l ince Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates, RTS and CTS Delays Distribution Mathod: Third-party Price: \$245

Number Installed to Date: 100 - 500 Date First Installed: 1982

INTER-LINK LDM-1V Modem Class: Short-Haul Transmission Technique: Asynchronous, Synchronous, Isochronous

Transmission Mode: Full-Duplex
Transmission Rate: Synchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 bps, 56,000 bps; Asynchronous/ Synchronous - Up to 250K bps Interface: CCITT V.35 Transmission Madium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates, RTS and CTS Delays Distribution Method: Third-party Price: \$600 Number Installed to Date: Under

100 Date First Installed: November 1983

INTERNATIONAL DATA SCIENCES, INC. PHONE LINK ACOUSTIC MODEM Modern Class: Coupler Transmission Technique:

Asynchronous Transmission Mode: Half-Duplex. Full-Duplex sion Rate: Asynchronous -110 bos, 300 bos

Interface: RS-232C Bell-Competible: 113 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Self-Test Function

Distribution Method: End user Price: \$189 Number Installed to Date: Under 100

Date First Installed: 1983 (See Vendor Profile Page V-16)

INTERNATIONAL DATA SCIENCES, INC. **AUTO LINK 212** Modern Class: Long-Haul

Transmission Technique: Asynchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Features: Autoenswer. Altern Voice/Data, Switchable Data Rates. Analog Loopback Distrib ution Method: End user Price: \$549 Number Installed to Date: Under 100 Date First Installed: 1983

INTERNATIONAL DATA SCIENCES, INC. AUTO LINK 1200 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous -1,200 bps interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Features: Autoanswer, Alternate

Voice/Data, Analog Loopback Distribution Method: End user Price: \$499 Number Installed to Date: Under 100

Date First installed: 1983 INTERNATIONAL DATA

SCIENCES, INC. Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Switchable Data Rates, Analog

Loophack Distribution Method: End user Price: \$599 Number Installed to Date: Under 100

Date First Installed: 1983

INTERNATIONAL DATA SCIENCES, INC. MICRO LINK 300 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade

Lines

Diagnostics: No Features: Autoanswer, Alternate Voice/Data, Analog Loopback Distribution Method: End user Price: \$239 Date First Installart: 1983

INTERNATIONAL DATA SCIENCES, INC. MICRO LINK 1200 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -1,200 bos Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: No

Features: Alternate Voice/Data, Analog Loopback Distribution Method: End user Price: \$449 Number installed to Date: Under 100

Date First Installed: 1983

INTERNATIONAL DATA SCIENCES, INC. PASSWORD AUTODIAL 212A Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Transmission Rate: Asynchronous -300 hps 1 200 hps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer, Switchable Data Rates Distribution Method: End user Price: \$449 Number installed to Date: Under

Date First Installed: 1983 INTERNATIONAL DATA SCIENCES, INC. MODEL 6110

Modern Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous smission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bos. 1,800 bos. 2,400 bos. 7,200 bps; Synchronous - 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Interface: RS-232C Transmission Medium: Low Capacity Cable Distribution Method: End user Price: \$370 Number Installed to Date: 100 - 500 Date First Installed: 1980

INTERNATIONAL DATA SCIENCES, INC. MODEL 6000H Modem Class: Short-Haul

Transmission Technique Synchronous Transmission Mode: Half-Duplex, Full-Dunley Transmission Rate: Synchronous -9,600 bps, 14,400 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Twisted-Pair Conductor Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates, Analog Loopback Distribution Method: End user Price: \$750 Number Installed to Date: 100 - 500 Date First Installed: 1980

INTERNATIONAL DATA SCIENCES, INC. MODEL 6000L Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C Bell-Compatible: 43401
Transmission Medium: Twisted Pair Diagnostics: Yes; Built-in Features: Disgnostics, Switchable Data Rates, Analog Loopback

Distribution Method: End user Price: \$750 Number installed to Date: 100 - 500 Date First Installed: 1980 INTERNATIONAL DATA

SCIENCES, INC.

MODEL 6200 Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dupley Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, TTY Current Loon Transmission Medium: Metallic Twisted Pair Features: Analog Loopback Distribution Method: End user Price: \$250 or Installed to Date: 100 - 500

Date First Installed: 1980 INTERNATIONAL DATA SCIENCES, INC. **MODEL 6220** 

Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, TTY Current

Bell-Compatible: 43401 Transmission Medium: Metallic Twisted Pair Diagnostics: Yes: Built-in

Features: Analog Loopback Distribution Method: End user Price: \$300 Number Installed to Date: 100 - 500 Date First Installed: 1980

INTERNATIONAL DATA SCIENCES, INC. **MODEL 6240** Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex sion Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bos. 1.800 bos. 2.400 bos. 4.800 bps, 9,600 bps Interface: RS-232C, TTY Current Loop Bell-Compatible: 43401
Transmission Medium: Twisted Pair

Conductor Diagnostics: Yes; Built-in Features: Diagnostics, Analog Loopback Distribution Method: End user Price: \$400

INTERNATIONAL MODEM EXCHANGE (TIMECOR) THE OPERATOR Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps

Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoanswer, Switchable Data Rates, Autodisconnect Distribution Method: End user Price: \$159

Date First Installed: May 1983 (See Vendor Profile Page V-17) ITT TELECOMM PRODUCTS, INC.

629-045-000-00X Modem Class: Digital Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56K bps Interface: RS-232C, RS-449, CCITT V 35

Transmission Medium: Four-Wire Circuit Diagnostics: Yes; Built-in Features: Switchable Data Rates, Autoequalizer, Diagnostics Distribution Method: End user

Price: \$775 - \$1,200 Number Installed to Date: 1,000 -5,000 (See Vendor Profile Page V-17)

J B M ELECTRONICS MODEM SAVER

Modem Class: Modem Eliminator Transmission Technique:

Transmission Rate: Synchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bos. 9,600 bos. 14,400 bos. 19,200 bps, 56,000 bps Interface: RS-232C Transmission Medium: Digital Links Diagnostics: No Distribution Method: Third party Price: \$265 Number Installed to Date: 1,000 -5,000 Date First Installed: September (See Vendor Profile Page V-00)

J B M ELECTRONICS ASYNCHRONOUS/SYNCHRONOUS LINE DRIVER Modern Class: Line Driver Transmission Technique:

Asynchronous, Synchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14 400 hos 19 200 hos 56 000 hos Interface: RS-232C Transmission Medium: Voice-Grade

Lines Diagnostics: No Distribution Method: Third-Party Price: \$135 - \$225 Number Installed to Date: 1,000 -5,000

Date First Installed: September

KAPUSI LABORATORIES DT 19.2 DATA TRANSEIVER Modern Class: Short-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 14,400 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Metallic Circuit Diagnostics: No Distribution Method: End user Price: \$1,190 Number Installed to Date: 500 -

(See Vendor Profile Page V-17) KAUFMAN RESEARCH MANUFACTURING, INC. 401 MODEM/PORT CONTENTION UNIT

1.000

Modem Class: Modem Eliminator Transmission Technique: Synchronous Transmission Mode: Half-Duplex Transmission Rate: Synchronous -14,400 bps Interface: RS-232C Transmission Medium: Voice-Grade

Lines Diagnostics: No Features: Switchable Data Rates, Enable/Disable Switch Distribution Method: Enduser Third-party Number Installed to Date: 100 - 500 Date First installed: 1979 (See Vendor Profile Page V-17)

KINEX CORP. SAB-2X4

Modern Class: Line Driver Transmission Technique: Asynchronous, Synchronous, Isochronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Asynchronous/ Synchronous - 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CGITT V.24.

CCITT V.28
Transmission Medium: Metallic
Conductor
Feetures: Diagnostics, Fallback,
Switchable Data Rates, Strappable

Equalizer Distribution Method: Third-party Price: \$545 Number Installed to Date: 500 -

Date First Installed: 1981 (See Vendor Profile Page V-17)

KINEX CORP. 2400/FDX Modern Class: Long-Haul

Transmission Technique:
Asynchronous, Sprohronous
Transmission Mode: Hall-Duplex,
Full-Duplex.
Full-Duplex.
Transmission Rate: Asynchronous/
Synchronous - 1,200 bps, 2,400 bps
Interface: R5-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-In

Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoenswer, Alternate Voice/Data,
Diagnostics, Fallback, Switchable
Data Rates, Echo Canceling
Distribution Method: Third-party

KIMEX CORP.
4800/208/AB
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 4,800 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Bell-Compatible: 2084/B
Transmission Medium: Voice-Grade

Diagnoatics: Yes; Built-in Features: Autoequalizer, Autoenswer, Alternate Volce/Data, Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party

Price: \$1,725 Number installed to Date: 500 -1,000 Date First installed: May 1981

KIMEX CORP.

4800/27 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps, Synchronous - 4,800 bps Interface: RS-232C, CCITT V.24,

CCITT V.28
Bell-Compatible: V.27 BIS
Transmission Medium: Voice-Grade
Lines

Diagnostics: Yes; Bullt-in Features: Autooqualizer, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Multiport, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$2,225 Data First Installed: 1981

KINEX CORP.

KINEX CORP.
9000/29
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Synchronous 4,800 bps, 9,600 bps;
Asynchronous/Synchronous - 7,200 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade

Transmission Medium: Voice-Grace Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Alternate Voice/Data, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$2,750 Number Installed to Date: 100 - 500

Date First Installed: 1982 KINEX CORP.

9800/DCM
Modern Clans: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Transmission Rate: Synchronous
-4,800 bps, 9,600 bps, 19,200 bps;
Asynchronous/Synchronous -7,200
bps
Interface: RS-232C, CCITT V.24,

CCITT V.28
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in

Features: Autoequalizer, Autoanswer, Diagnostics, Switchable Data Rates, Data Compression Capabilities Distribution Method: Third-party Price: \$3,650 Number Installed to Date: Under

100 Date First Installed: 1983

KIMEY CORP.

9600/FP
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex
Transmission Rate: Synchronous 4,800 bps, 9,600 bps;

4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps

interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Rates

Distribution Method: Third-party Price: \$3,350 Date First Installed: 1983

KINEX CORP.

9600/M Modem Claes: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Fulf-Duplex Transmission Rate: Synchronous -4,800 bps; 9,600 bps;

Asynchronous/Synchronous - 7,200 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade

Lines
Diagnostica: Yes; Built-in
Features: Autoequalizer,
Diagnostics, Multiport, Fallback,
Switchable Data Rates, Simulated
Control Carrier
Distribution Method: Third-party

Price: \$3,650
Number Installed to Date: Under

Date First Installed: 1983

KINEX CORP.

4-WIRE BASEBAND
Modem Class: Short-Haul
Transmission Technique:
Asynchronous, Synchronous,
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex, Simplex
Transmission Rate: Asynchronous/
Synchronous - 600 bps, 1,200 bps,
2,400 bps, 4,800 bps, 9,600 bps,

14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Metallic Conductor

Diagnostics: Yes; Built-in Features: Diagnostics, Fallback, Switchable Data Rates, Strappable Equalizer Distribution Method: Third-party

KINEX CORP.

2400/201C Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Fulf-Duplex Transmission Rate: Synchronous-1,200 bps, 2,400 bps interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 201C

Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Reverse Channel, Diagnostics, Fallback,

Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party LED SYSTEMS, INC.

188C

Modem Class: Infrared
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous14,400 bps; Asynchronous14,400 bps; Asynchronous14,400 bps; Asynchronous100,000 bps
Interface: R5-232C, RS-449, RS422, CCITT V.22, CCITT V.24,
CCITT V.26, CCITT V.27, CCITT
V.28, CCITT V.29, 20 MA Current
Loop, 60 MA Current Loop, Mil.

Transmission Medium: Infrared Light Features: Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$6,950 Number Installed to Date: Under 100 Date First Installed: September

1980 (See Vendor Profile Page V-18)

LED SYSTEMS, INC.
4DT1/7DT1
Modern Class: Infrared
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-1.1

Interface: RS-449, V.35 Bell-Compatible: 551A Transmission Medium: Infrared Light Features: Alternate Voice/Data,

Diagnostics
Distribution Method: Third-party
Price: \$8,350 to \$12,550
Number Installed to Date: Under

100 Date First Installed: September

LEXICON CORP. OF MIAMI

LEX-1
Modem Class: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous 300 bps

Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: Third-party

Price: \$145 Number Installed to Date: 5,000 -10,000 Date First Installed: 1983 (See Vendor Profile Page V-18)

LEXICON CORP. OF MIAMI LEX-11 CCI II Modern Class: Coupler

Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps

Interface: BS-232C

Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Disgnostics: No Distribution Method: Third-party Price: \$176 Number Installed to Date: 10,000 -50,000 Date Store Installed: 1083

LEXICON CORP. OF MIAMI
LEX.-11 CCI III
Modem Class: Coupter
Transmission Technique:
Asynchronous
Transmission Moos: Full-Duplex
Transmission Rate: Asynchronous
-300 bps
Interface: RS-232C
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Distribution Method: Third-party
Price: \$216
Number Installed to Date: 10,000
-50,000
Date First Installed: 1983

LEXICON CORP. OF MIAMI LEX-11B Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps face: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: Third-party Number Installed to Date: 10,000 - 50,000 Price: \$185 Date First installed: 1983

LEXICON CORP. OF MIAMI
LEX-12
Modern Class: Coupler
Transmission Textings:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rest: Asynchronous 300 bps
Interface: RIS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Features: Switch to Handset
Distribution Method: Third-party
Price: \$165
Number Installed to Date: 10,000 50,000
Date First Installed: 1981

LEXICON CORP. OF MIAMI
LEX-128
Modem Class: Coupler
Transmission Technique:
Asynchronous
Transmission Rede: Full-Duplex
Transmission Rede: Asynchronous 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines

ution Method: Third-party Price: \$205 Number Installed to Date: 10,000 -Date First Installed: 1981 LEXICON CORP. OF MIAMI FY-15 Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Switchable Data Rates, Switch to Handset ution Method: Third-party Price: \$325 Number installed to Date: 10,000 -

Diagnostics: No Features: Switch to Handset

50.000 Date First Installed: 1982 LEXICON CORP. OF MIAMI LEX-158 Hodem Class: Couple Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Diagnostics: No Features: Switchable Data Rates. Switch to Handset stion Method: Third-party Price: \$395 Number installed to Date: 10,000 -50.000 Date First Installed: 1982

LEXICON CORP. OF MIAM!
LEX-10
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Rate: Asynchronous 300 bps
Imbarface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Autoanswer
Distribution Method: Third-party
Price: \$119
Number Installed to Date: 10,000 50,000

50,000
Date First Installed: 1980

LEXICON CORP. OF MIAM!
LEX-108
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C

Lines
Diagnostics: No
Features: Autoanswer
Diaribution Method: Third-party
Price: \$159
Number Installed: Dute: 10,00050,000
Date First Installed: 1980
M/A-COM LINKABIT, IMC.
LM 46
Modem Class: Satellite
Transmission Technique:
Synchronous

Bell-Compatible: 103 Transmission Medium: Voice-Grade

Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
8,000 bps
Interface: CCITT V.35, T-1, DSI,
TTL
Transmission Medium: Digital Links
Disgnostics: Yes, Built-In
Features: Disgnostics
Distribution Method: End user
Price: \$223 - \$256
Number Installed: 1978
Date First Installed: 1979
See Vendor Profile Page V-18)

MADZAR CORP. Z9600 Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Features: Reverse Channel, Diagnostics, Fallback, Automatic Data Rates tion Method: End user Price: \$167

Number installed to Date: 500 -1,000 Date First Installed: March 1980 (See Vendor Profile Page V-18)

MANAGE, INC. FOM-232A Modem Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps 14,400 bps, 19,200 bps, 56,000 bps Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: No Distribution Man ution Method: End user, OEM Price: \$475 Number Installed to Date: Under 100 Date First Installed: September 1980 (See Vendor Profile Page V-18)

MANAGE, INC. FOM-1232 Modem Class: Fiber-Optic Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rete: Asynchronous
-110 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps, 2,400 bps, 1,800
bps, 9,600 bps, 1,4400 bps, 1,600
bps, 9,600 bps, 1,4400 bps, 1,620
bps, 9,600 bps, 1,4400 bps, 1,920
bps, 9,600 bps, 1,4400 bps, 1,920
bps, 9,600 bps
Transmission Mediaum: Fiber Optics
Diagnostics: No
Distribution Metihod: End user, OEM
Price: \$325
Number Installed to Dete: Under
100

MATH ASSOCIATES, INC. Modem Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -Lip to 100K has Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: No Features: Diagnostics Distribution Method: End user, OEM, Third-party Price: \$950 Number Installed to Date: Under 100 Date First Installed: October 1981 (See Vendor Profile Page V-18)

MATH ASSOCIATES, INC.
XR-1100
Modem Class: Fiber-Optic
Transmisation Technique:
Asynchronous
Transmisation Mode: Hall-Duplex,
Full-Duplex
Transmisation Rate: Asynchronous
Transmisation Rate: Asynchronous
Transmisation Rate: Technique:
Transmisation Redium: Fiber Optics
Diagnostics: No
Distribution Method: End user, OEM
Price: \$410
Number Installed to Date: 100 - 500
Date First Installed: August 1979

MATH ASSOCIATES, INC. XR-1150/55 Modem Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -Up to 100K bos Interface: RS-232C, RS-422 Transmission Medium: Fiber Optics Diagnostics: No Features: Direct Plug-in Module Distribution Method: End user, OEM, Third-party Price: \$349 Number Installed to Date: 100 - 500 Date First Installed: February 1983

MFJ ENTERPRISES MFJ 1233 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous - 300 bps Interface: RS-232C, TTL Bell-Competible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-In Features: Alternate Voice/Data, Diagnostics: Diatribution Method: End user, Third-party Price: \$125 Date First Installed: January 1982 (See Vendor Profile Page V-19)

MICOM SYSTEMS, INC. Modern Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex ission Rate: Asynchronous -14 400 hps Interfece: RS-232C, CCITT V 24 CCITT V 28 Transmission Medium: Custome Owned Cable Diagnostics: No Features: Diagnostics Distribution Method: Third-party Price: \$220 Number Installed to Date: 1,000 -5,000 Date First Installed: January 1983 (See Vendor Profile Page V-19)

MICOM SYSTEMS, INC. M420MI Modem Class: Line Driver **Transmission Technique:** Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -14,400 bps Interface: RS-232C, CCITT V.28 Transmission Medium: Customer Owned Cable Diagnostics: No Features: Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$320 Number Installed to Date: 500 -1.000 **Date First Installed: September** 1982

MICOM SYSTEMS, INC. M430 Modern Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -14 400 hns Interface: RS-232C, CCITT V.24. Transmission Medium: Voice-Grade Lines, Customer-Owned Cable Diagnostics: No Features: Powered by Interface Distribution Method: Third-party Price: \$85 Number installed to Date: 500 -1.000 **Date First Installed: September** 1983

MICOM SYSTEMS, INC. M4024, M4024/ASYNC Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V.26, CCITT V.28 Bell-Competible: 201 Lines Diagnostics: No Features: Diagnostics, Fallback Distribution Method: Third-party Price: \$795 to \$825 Number installed to Date: 500 -1.000 Date First installed: June 1981

MICOM SYSTEMS, INC.

Modern Class: Long-Haul Transmission Technique:

M4048/DB+

M4048/V.27+

Synchronous nsmission Mode: Half-Duplex, Full-Duplex lasion Rate: Synchronous -Trans 4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$3,295 Number Installed to Date: Under 100 Date First Installad: December 1983

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.26, CCITT V.27, CCITT V 28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Rates **Distribution Method: Third-party** Price: \$2.595 Number installed to Date: 100 - 500 Date First Installed: February 1983

MICOM SYSTEMS, INC.
M4048/V.27-NF
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous
4,800 bps
interface: RS-232C, CCITT V.24,
CCITT V.26, CCITT V.27, CCITT
V.28

**Data Rates** Distribution Method: Third-party Price: \$1,750 Number Installed to Date: 100 - 500 Date First Installed: February 1983 MICOM SYSTEMS, INC. M4096/4+ Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9,600 bos Interface: RS-232C, CCITT V.24, CCITT V.28, CCITT V.29 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer,

Diagnostics, Multiport, Fallback,

Distribution Method: Third-party Price: \$3,695

Number Installed to Date: Under

Switchable Data Rates

100

Transmission Medium: Voice-Grade

Diagnostics Fallback Switchable

Diagnostics: Yes; Built-in

Features: Autoequalizer.

Lines

MICOM SYSTEMS, INC.
M4096,DB +
Modern Cleas: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Synchronous
9,800 bps
Interface: RS-232C, CCITT V.24,
CCITT V.27, CCITT V.28, CCITT
V.29
Transmission Medium: Voloe-Grad
Lines

V.29
Transmission Medium: Voice-Grade Lines
Diagnostics: Yes; Built-in
Festures: Autoequalizer,
Autoanswer, Diagnostics, Fallback,
Switchable Data Rates
Distribution Method: Third-party
Price: \$3,795
Number Installed to Date: Under
100
Date First Installed: December 1983
MICOM SYSTEMS. INC.

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.28, CCITT V.29 Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Diagnostics, Fallback Distribution Method: Third-party Price: \$2,695 imber Installed to Date: 500 -1 000 Date First Installed: June 1982

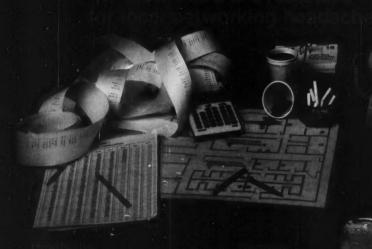
MICOM SYSTEMS, INC. M4096/V.29 + Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.28, CCITT V.29 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer Diagnostics, Fallback, Switchable Distribution Method: Third-party Price: \$3,095 Number Installed to Date: 100 - 500 Date First Installed: February 1983

MICOM SYSTEMS, INC. M401 Modern Class: Short-Haul Transmission Technique: Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -9,600 bps ce: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade lines Diagnostics: No Features: Diagnostics
Distribution Method: Third-party Price: \$250 Number installed to Date: 500 -1.000 Date First Installed: January 1982

MICOM SYSTEMS, INC. Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -14,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Diagnostics Distribution Method: Third-party Price: \$330 Number installed to Date: 500 -**Date First Installed: September** 

MACOM SYSTEMS, INC.
MA21
Modem Class: Short-faul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous
14,400 pps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines
Data Rates
Distribution Method: Third-party
Price: \$370
Number Installed to Date: 500 -

1.000



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Date First Installed: November 1981

#### MICOM SYSTEMS, INC.

M431 Modem Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -14,400 bos Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Voice-Grade

Disgnostics: No Features: Powered By Interface Distribution Method: Third-party Humber Installed to Date: 500 -1.000

Date First Installed: September

Lines

#### MICRO-BAUD SYSTEMS, INC. 80512

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -300 bps, Asynchronous - 1,200 bps Interface: RS-232C, RS-449 Bell-Competible: 212A
Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Diagnostics. Switchable Data Rates Distribution Method: Third-party Price: \$550 Number Installed to Date: 1,000 -5,000 Date First installed: January 1982 (See Vendor Profile Page V-19)

#### MICROBAUD SYSTEMS, INC.

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212A Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autodial, Diagnostics. Switchable Data Rates, Stores 5 Phone Numbers **Distribution Method:** Third-party Price: \$595 Number Installed to Date: 500 -1.000 Date First Installed: February 1983

MICROCOM, INC. ERA 2 FOR APPLE HE Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos. 1,200 bos. Interface: BS-232C Bell-Competible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: No

Features: Autodial, Autoequalizer, Autoanswer, Fallback, Switchable Distribution Mathod: Third-party Price: \$429 Date First Installed: January 1984 (See Vendor Profile Page V-19)

MICROCOM, INC. ERA 2 FOR IBM PC Modem Class: Short-Haul

Transmission Technique Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Beil-Competible: 103, 212 Transmission Medium: Voice-Grade Features: Autoequalizer, Autoanswer, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$429 Date First Installed: January 1984

MICROCOM, IN ERA 2 FOR IBM PC JR Modern Class: Short-Hauf Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos. 1,200 bos Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines

Diagnostics: No Features: Autodial, Autoequalizer, Autoanswer, Fallback, Switchable Date Rates Distribution Method: Third-party

Date First Installed: January 1984 MICROCOM, INC. PCS FLASH 2000 NETWORKING MODEM Modern Class: Short-Haut

Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C Bell-Competible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: No

Features: Autodial, Autoequalizer, Autoanswer, Clock Calendar, Fallback Switchable Data Rates Distribution Method: Third-party Price: \$995

Date First Installed: November 1983

MICROCOM, INC. RX FLASH 1000 NETWORKING MODEM Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex,

Full-Dunley Transmission Rate: Asynchronous -

110 bps. 300 bps. 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Autoequalizer.

Autoanswer, Diagnostics, Multiport, Fallback Switchable Data Rates Distribution Method: Third-party Price: \$895 Date First Installed: November 1983

THE MICROPERIPHERAL AUTOPRINT MICROCONNECTION

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer. Alternate Voice/Data Distribution Method: Third-party Price: \$149 Number Installed to Date: 1,000 -Date First Installed: January 1979

(See Vendor Profile Page V-19) THE MICROPERIPHERAL

BS232 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 hns Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade

Lines Feetures: Autodial. Autoanswer. Alternate Voice/Data **Distribution Method:** Third-party Price: \$159 to \$199 Number installed to Date: 1,000 -

THE MICROPERIPHERAL CORP. SUBMINIATURE OEM MODEM

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autodial, Autoanswer Distribution Method: OEM

Number Installed to Date: 1,000 -

THE MICROPERIPHERAL CORP. TRS 80 MODEL 1 Modem Class: Long-Haul

5,000

Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Beli-Compatible: 103
Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer, Alternate Voice/Data Distribution Method: Third-party Price: \$209 to \$259 Number Installed to Date: 1,000 -

MODULAR INTEGRATION, INC. MSM-690

Modem Class: Long-Haul Transmission Technique Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade **Date First Installed:** September 1980 (See Vendor Profile Page V-20)

MUIRHEAD, INC. HIS3 GROUP DATA MODEM Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex. Simplex Transmission Rate: Asynchronous/ Synchronous - 48,000 to 172,000 Interface: RS-422, CCITT V.35 Transmission Medium: Group Band Circuits Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Multiport, Simultaneous

Voice/Data Distribution Method: End use Number Installed to Date: 100 - 500 Date First Installed: 1973 (See Vendor Profile Page V-20)

MULTI - TECH SYSTEMS,

INC. MT 103J Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Dunlex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user Price: \$250 Date First Installed: July 1979 (See Vendor Profile Page V-20)

MULTI - TECH SYSTEMS, MT 201B Modem Class: Long-Haul

Transmission Tachnique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2 400 hos Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: No

Features: Diagnostics Distribution Method: End user Prine: \$685 Date First Installed: September

MULTI - TECH SYSTEMS.

MT 202T Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bos Interface: RS-232C

Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Diagnostics

Distribution Method: End user Price: \$345 Date First Installed: March 1978

MULTI - TECH SYSTEMS,

INC.

MT 212AD Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Dunley Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$695 Date First Installed: May 1983

MULTI - TECH SYSTEMS. MT 212AH

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C

Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Autoanswer,

Alternate Voice/Data, Diagnostics, Switchable Data Rates

Distribution Method: End user Price: \$549 Date First Installed: September

MULTI - TECH SYSTEMS.

MT 212C Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous mission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/

Synchronous - 1,200 bps

Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user Price: \$550 Date First Installed: February 1983

MULTI - TECH SYSTEMS,

MT 212PC Modem Class: Long-Haul Transmission Technique:

Asynchronous namission Mode: Half-Duplex. Full-Duplex

Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: IBM Expansion Slot Bell-Competible: 103, 212 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Autodial, Autoansw Alternate Voice/Data, Diagnostics, Switchable Data Rates, Software Distribution Method: End user

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Price: \$549 Date First Installed: November 1983

MULTITRONICS CATY MODEM Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rets: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bos. 9,600 bos Interface: RS-232C Transmission Medium: Coaxial Features: Reverse Channel Switchable Data Rates Distribution Method: End user Price: \$2,000 (See Vendor Profile Page V-20)

NCR COMTEN, INC. NCR COMTEN 7163 0100 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Transmission Madium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Fallback Switchable Data Rates, NCCF/NPDA Compatible Distribution Method: End user (See Vendor Profile Page V-21)

NCR COMTEN, INC. NCR COMTEN 7163 0200 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates, NCCF/NPDA Compatible Distribution Method: End user

NCR COMTEN, INC. NCR COMTEN 7164 0100 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4.800 bps Interface: RS-232C, CCITT V.24. CCITT V.28 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Fallback Switchable Data Rates, NCFF/NPDA Compatible Distribution Method: End user

Number Installed to Date: 200

Date First Installed: 1983

NCR COMTEN. INC. NCR COMTEN 7164 0200 Modern Class: Long-Haul Transmission Technique: Synchronous mission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -Interface: RS-232C, CCITT V.24. CCITT V 28 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in stures: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates, NCCF/NPDA Compatible Distribution Method: End user

HCR COMTEN, INC. NCR COMTEN 7165 0100 Modern Class: Long-Haul Transmission Technique: Synchronous ensmission Mode: Half-Duplex, Full-Dunley Transmission Rate: Synchronous -9,600 bps Interface: RS-232C, CCITT V.24 CCITT V 28 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Fallback, Switchable Data Rates, NCCF/NPDA Compatible Distribution Method: End user Price: \$5,800 Number Installed to Date: Under Date First Installed: September

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rale: Synchronous-110 bps, 300 bps Interface: RS-222C2 Belt-Competible: 103 Transmission Medium: Voice-Grade Lines Transmission Medium: Voice-Grade Voice-Voice-Grade Voice-Grade Voice-Gra

NEC TELEPHONE, INC.

9103JR

DSP 208
Modern Clear: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex
Transmission Rate: Synchronous
4,800 bps
Interface: RS-232C
Bell-Compatible: 208
Transmission Medium: Volce-Grade
Lines
Diagnostics: Yes; Built-in
Features: Autorou salizer

NEC TELEPHONE, INC.

Autoanswer, Diagnostics, Fallback Distribution Method: Third-party Price: \$1,750 Number installed to Date: 50 Date First installed: December 1983 NEC TELEPHONE, INC.

**DSP 224** Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2,400 bps nterface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Clock Calendar, Fallback, Switchable Data Distribution Method: Third-party Price: \$1,195 lumber installed to Date: 45 Date First Installed: December 1983 MEC TELEPHONE, INC.

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4.800 bos Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autoequalizer. Autoanswer, Diagnostics, Clock Calendar, Fallback Distribution Method: Third-party Price: \$1,695 Number Installed to Date: 600 Date First Installed: December 1982

NEC TELEPHONE, INC.

DSP 9600-U

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9 600 hos Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Clock Calendar, Fallback, Switchable Data Rates **Distribution Method: Third-party** Price: \$2,695 Number installed to Date: 400 Date First Installed: December 1982

NEC TELEPHONE, INC.
N113C-DR
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Madei: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Interface: RS-232C
Bell-Compatible: 113

Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Buill-in Features: Autoequalizer; Autoanswer; Standard Diagnostics Distribution Method: Third-party Price: \$430 Number Installed to Date: 350 Date Pirst Installed: October 1982

HEC TELEPHONE, INC.
N201C
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Refe: Synchronous 2,400 bps
Interface: RS-232C
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Features: Autoequalizer,
Autonanswer, Clock Calendar.

Lines
Features: Autoequalizer,
Autoanswer, Clock Calendar,
Fallback, Switchable Data Rates,
Standard Diagnostics
Distribution Method: Third-party
Price: \$845
Number Installed: January 1983

NEC TELEPHONE, INC.

**N201CR** Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -2.400 bps Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Features: Autoequalizer. Autoanswer, Clock Calendar, Fallback, Switchable Data Rates, Standard Diagnostics Distribution Method: Third-party Price: \$895 Number installed to Date: 1,500 Date First Installed: July 1982

NEC TELEPHONE, INC. Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1.200 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Autoanswer, Reverse Channel, Standard Diagnostics Distribution Method: Third-party Price: \$495 Date First Installed: December 1982

MEC TELEPHONE, INC.
N202T
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 1800 hos

Price: \$3,700

Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Features: Autoequalizer. Autoanswer, Reverse Channel, Standard Diagnostics Distribution Method: Third-party Price: \$400 Number Installed to Date: 300 Date First Installed: December 1983

HEC TELEPHONE, INC. N212AR Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1.200 bos Interface: RS-232C Bell-Competible: 103, 113, 212
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Switchable Data Rates, Standard Diagnostics

Distribution Method: Third-party Price: \$695 Number Installed to Date: 3,000 Date First Installed: July 1982 NEC TELEPHONE, INC.

N212BR Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212A Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Fallback, Switchable Data Rates, Standard Diagnostics
Distribution Method: Third-party

Price: \$/90 Number Installed to Date: 1,200 Date First Installed: October 1982

Price: \$795

NEC TELEPHONE, INC. SP1440-U Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -19,200 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Clock Calendar, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$7,800 Number installed to Date: 200 Date First Installed: October 1983

NEC TELEPHONE, INC. SP9600-FAST-U Modern Class: Long-Haul

Transmission Technique: Synchronous Transmission Rate: Synchronous -9,600 bps Interface: RS-232C Transmission Marikum: Voice-Grade Lines Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoanswer, Diagnostics, Clock
Calendar, Fallback, Switchable Data Distribution Method: Third-party

Date First Installed: April 1984

Price: \$2,000

MEC TELEPHONE, INC. SPN 4800-U Modern Class: Long-Haul mission Technique Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps Interface: RS-232C
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoenswer, Diagnostics, Multiport, Clock Calendar, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$3,500

NEC TELEPHONE, INC. SPN 9600-U Modem Class: Long-Haul Transmission Technique: Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9,600 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Diagnostics, Multiport, Clock Calendar, Fallback, Switchable Distribution Method: Third-party Price: \$7,000 Date First Installed: April 1984

NESCO DSU/CSU 1600 R-4 Modern Class: Digital Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -56,000 bps Interface: V.35
Bell-Compatible: 501
Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Alternate Voice/Data, Reverse Channel, Diagnostics, Multiport Distribution Method: End user Price: \$1,125 (See Vendor Profile Page V-21)

DSU/CSU 1600R-3 Modem Class: Digital Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C Bell-Compatible: 500B Transmission Medium: m: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoenswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Switchable Data Rate Distribution Method: End user Price: \$795 Number Installed to Date: Under 100 Date First Installed: 1982 MESCO

Transmission Technique:

DSU/CSU 1600R-5 Modern Class: Digital (DSU) Transmission Technique: Asynchronous Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous -2,400 bps, Asynchronous - 4,800 bps, Asynchronous - 9,600 bps Interface: RS-232C Bell-Compatible: 500, 501 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Bullt-in Features: Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$700 to \$900 Number Installed to Date: 500 -

NETWORK PRODUCTS, INC.

NP-48 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex nission Rate: Synchronous -4.800 bos Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer. Diagnostics Distribution Method: End user. Third-party Price: \$1.800 Number Installed to Date: 500 -1,000 Date First Installed: January 1978 (See Vendor Profile Page V-21)

**HETWORK PRODUCTS, INC.** NP-96 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps, Asynchronous/Synchronous - 7,200 bos Interface: RS-232C, CCITT V.24, CCITT V 29 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer,

Third-party Price: \$2,750 Number Installed to Date: 1,000 -5.000 Date First Installed: January 1978 NOAKES DATA COMMUNICATIONS, INC. N76/5-1 Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bos Interface: RS-232C, 20 MA Current Beil-Compatible: 103, 113 Transmission Medium: Switch Network Distribution Method: End user

Diagnostics, Fallback, Switchable

Distribution Method: End user.

Data Rates

Price: \$155

5,000

NOAKES DATA

COMMUNICATIONS, INC. N76/5-2 Modem Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 hps Interface: RS-232C, 20 MA Current Bell-Competible: 103, 113 Transmission Medium: Switch Network Distribution Method: End user Price: \$170 Number installed to Date: 1,000 -

Number Installed to Date: 1,000 -

(See Vendor Profile Page V-22)

NOAKES DATA COMMUNICATIONS, INC. Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 hns Interface: RS-232C, 20 MA Loop Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade lines Features: Autoanswer Distribution Method: End user Price: \$385 Number Installed to Date: 1,000 -

NOAKES DATA COMMUNICATIONS, INC. Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bos Interface: RS-232C, 20 MA Current Loop Bell-Compatible: 103, 113

Transmission Medium: Voice-Grade Lines Feetures: Autodial, Autoanswer, TWX Options Distribution Method: Third-party Number installed to Date: 1.000 -5.000

#### NORTHERN TELECOM, INC. 2230

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 600 bps, 1,200 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 113 Trunsmission Medium: Voice-Grade Lines Features: Autoequalizer Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics. Multiport, Switchable Data Rates Distribution Method: End user Price: \$675 Number Installed to Date: 500 -1.000 Date First Installed: June 1982 (See Vendor Profile Page V-22)

#### NORTHERN TELECOM, INC. 2240

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex nission Rate: Synchronous -Transn 2,400 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Alternate Voice/Data. Reverse Channel, Diagnostics Distribution Method: End user Price: \$850 Number Installed to Date: 100 - 500 Date First Installed: April 1981

#### NORTHERN TELECOM, INC. 2250

Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Dunley Full-Duplex sion Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 208 Transmission Medium: Voice-Grade Lines Feetures: Autoequalizer. Autoanswer, Alternate Voice/Data,

Reverse Channel, Diagnostics Distribution Method: End user Price: \$1,995 Number Installed to Date: 100 - 500 Date First Installed: 1982

NORTHERN TELECOM, INC. 2260

Modem Class: Long-Haul Transmission Technique: Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Synchronous -9 600 bos Interface: RS-232C, CCITT V.24 Bell-Compatible: 209 Transmission Medium: Voice-Grade Lines Features: Autoequalizer Autoanswer, Alternate Voice/Data

Reverse Channel, Diagnostics Distribution Method: End user Price: \$2.995 Number Installed to Date: Under 100

Date First installed: 1982

#### MOVATION, INC.

CAT

Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade Disgnostics: Yes: Built-in Features: Diagnostics. Originate/Answer
Distribution Method: OEM. Third-

Price: \$189 (See Vendor Profile Page V-22) NOVATION, INC. CCITT CAT

Modern Class: Coupler Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duolex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Originate/Answer Distribution Method: OEM, Third-Price: \$299

NOVATION, INC. 21 APPLE-CAT II Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dupley Full-Dunley Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200

Date First Installed: 1980

Interface: Apple Parallel Bus Bell-Compatible: 103, 113, 202, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Autoanswer. Alternate Voice/Data, Diagnostics,

Switchable Data Rates Distribution Method: OEM. Thirdparty Price: \$389 to \$725

Date First Installed: September

NOVATION, INC. 103 SMART-CAT

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer. Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OFM Third-

party Price: \$249 Date First Installed: 1982

NOVATION, INC. 103/212 SMART-CAT Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -

300 bps. 1.200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial. Autoanswer.

Atternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OFM Third-

party Price: \$595 Date First Installed: 1982

#### NOVATION, INC. 212 AUTO-CAT Modern Class: Long-Haul Transmission Technique:

Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bos. 300 bos: Asynchronous/ Synchronous - 1,200 bps Interface: RS-2320 Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OEM, Third-Price: \$695

Date First Installed: 1982 HOVATION, INC. APPLE-CAT II

Modern Class: Long-Hauf Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: Apple Parallel Bus Bell-Compatible: 103, 113, 202 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer,

Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OEM. Thirdparty Price: \$389

NOVATION, INC. D-CAT

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Dunlex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Alternate Voice/Data, Diagnostics Distribution Method: OEM, Third-Price: \$199 Date First Installed: 1980

NOVATION, INC.

J-CAT Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C, TTL Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: OFM Thirdparty Price: \$149

Date First Installed: 1982

MOVATION, INC. PC1200B Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous -

300 bps, 1,200 bps Interface: IBM PC Parallel Bus Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OEM, Thirdparty Price: \$595

NU DATA CORP.

108 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 208 Transmission Medium: Voice-Grade Lines

Features: Autoequalizer, Autoanswer, Switchable Data Rates Distribution Method: End user, Third-party (See Vendor Profile Page V-22)

#### OPTELECOM

4110 Modern Class: Fiber-Optic Transmission Technique: Asynchronous

Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -100M bos Interface: RS-232C. MIL 188C

Transmission Medium: Fiber Optics Features: Diagnostics, Multiport Distribution Method: End user, OEM Price: \$160 Number installed to Date: 100 - 500 (See Vendor Profile Page V-22)

#### OPTELECOM

4121 Modern Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -100M bps Interface: RS-232C Transmission Medium: Fiber Optics Features: Multiport, Status Lights Price: \$160 Number Installed to Date: 100 Date First Installed: April 1982

# OPTICAL COMMUNICATIONS

FD-10K Modern Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bos. 9.600 bos. 10.000 bos Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: Yes; Add-on Features: Reverse Channel, Diagnostics, Switchable Data Rates Price: \$1,200 (See Vendor Profile Page V-22)

#### OPTICAL COMMUNICATIONS CORP.

FD-20K Modern Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 hns 20 000 hns Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: Yes; Add-on Features: Reverse Channel, Diagnostics, Switchable Data Rates Price: \$1,690

#### OPTICAL COMMUNICATIONS CORP. FD-56K

Modern Class: Fiber-Optic

Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 20,000 bps Interface: RS-2320 Transmission Medium: Fiber Optics Diagnostics: Yes; Add-on Features: Reverse Channel Diagnostics, Switchable Data Rates Distribution Method: End user

## OPTICAL COMMUNICATIONS

FD-1200

Modern Class: Fiber-Optic Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: Yes; Add-on Features: Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$1,040

#### Date First Installed: 1980 PARADYNE CORP. CHALLENGER 2400

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps terface: CCITT V.26, CCITT V.27, CCITT V.29 Transmission Medium: Voice-Grade Lines Features: Diagnostics, Fallback Price: \$700

(See Vendor Profile Page V-23)

Asynchronous, Synchronous

Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/

#### PARADYNE CORP. CHALLENGER 4800 Modern Class: Long-Haul Transmission Technique:

Synchronous - 2,400 bps, 4,800 bps Interface: CCITT V.26, CCITT V.27. CCITT V.29 Transmission Medium: Voice-Grade Features: Diagnostics, Fallback Price: \$1,500 PARADYNE CORP. CHALLENGER 9600 Modem Class: Long-Haul **Transmission Technique:** Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 4,800 bps, 9,600 bps; 7.200 bos Interface: CCITT V.24, CCITT V.26. CCITT V.27, CCITT V.29 Transmission Medium: Voice-Grade

Lines

Features: Diagnostics, Fallback Price: \$2.600

#### PARADYNE CORP. DTIL-1200D

Modem Class: Long-Haul Transmission Technique Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Bell-Compatible: 212 Transmission Medium: Voice-Grade Feetures: Autodial

#### PARADYNE CORP.

LSI 24C Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex
Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, Asynchronous/Synchronous - 2,400 bps Interface: RS-232C Bell-Compatible: 201
Transmission Medium: Voice-Grade

#### Date First installed: 1981 PARADYNE CORP. MP 14.4 Modern Class: Long-Haul Transmission Technique:

Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -9,600 bps, 19,200 bps; Asynchronous/Synchronous - 12K bps Interface: RS-232C, CCITT V.24, CCITT V.26, MIL 188C Transmission Medium: Voice-Grade Lines Features: Autodial, Diagnostics,

### Fallback, 6 Port Mux PARADYNE CORP. MP 14.4 SM

Date First Installed: 1980

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -9,600 bps, 19,200 bps; Asynchronous/Synchronous - 12K Interface: RS-232C, CCITT V.24. **CCITT V.26, MIL 188C** Transmission Medium: Voice-Grade Lines

#### PARADYNE CORP.

Multiplexer

Features: 16 Port Statistical

MP 16.0 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -9,600 bps; Asynchronous/ Synchronous - 16,000 bps

Interface: RS-232C, CCITT V.24. MIL 188C on Medium: Voice-Grade Lines Features: Autodial, Diagnostics. Fallback

#### Date First Installed: 1981 PARADYNE CORP.

MP 48/2088 Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous
Transmission Mode: Half-Duplex
Transmission Rate: Asynchronous/ Synchronous - 4,800 bps Interface: CCITT V.27 Bell-Compatible: 208 Transmission Medium: Voice-Grade linae Features: Autoanswer Date First Installed: 1980

#### PARADYNE CORP.

MPX 2400 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: CCITT V.26, CCITT V.27, CCITT V 29 Transmission Madium: Vnico-Grade Lines Features: Autoequalizer, Diagnostics, Fallback

#### Date First Installed: 1983 PARADYNE CORP. MPX 4800

Price: \$950

Modem Class: Long-Haul **Transmission Technique:** Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps, 4,800 bps interface: CCITT V.26, CCITT V.27. CCITT V 29 Transmission Medium: Voice-Grade Lines Features: Autoequalizer, Diagnostics, Fallback, Multiplexer Option Price: \$2,000 Date First Installed: 1983

#### PARADYNE CORP. MPX 9600 Modem Class: Long-Haul

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 4,800 bps, 9,600 bps; Synchronous - 7,200 bps Interface: CCITT V.26, CCITT V.27, CCITT V.29 nission Medium: Voice-Grade Lines Features: Autoequalizer, Multiplexer Option Price: \$3,400 Date First Installed: 1983

PECA. INC. EXT-1212 Modem Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex Transmission Rate: Synchronous -56,000 bos Interface: CCITT V.24 Transmission Medium: Cable Diagnostics: No Features: Reverse Channel. Multiport, Fallback, Switchable Data Rates Distribution Method: End user Price: \$1,600 (See Vendor Profile Page V-23)

PENBIL CORP.

PENRIL CORP.

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$525 Number installed to Date: 5,000 -10.000 Date First Installed: February 1979 (See Vendor Profile Page V-23)

300/1200 AUTO DIAL Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps erface: RS-232C, CCITT V.24, CCITT V 28 Bell-Compatible: 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial. Autoansy Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$650 Number Installed to Date: 5,000 -10.000 Date First Installed: January 1982

PENNIL CORP. 1800 DED Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Full-Duplex, Simplex Transmission Relac Asynchronous -10 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 1800 bps, 1,200 bps, 1,800 bps, 1,800 bps, 1,800 bps, 1,800 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 202

Lines Diagnostics: Yes; Built-in Distribution Method: Third-party Price: \$375 Number Installed to Date: 5.000 -10,000 Date First Installed: July 1973 PENRIL CORP. 2127 Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes: Built-in Features: Autodial, Autoequalizer, Alternate Voice/Data, Switchable Data Pates Distribution Method: Third-party Number Installed to Date: Under 100 Date First Installed: September

Transmission Medium: Voice-Grade

PENRIL CORP. 2129 fodem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.28, CCITT V.29 Trans nission Medium: Voice-Grade I ines Diagnostics: Yes; Built-in atures: Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Fallback, Switchable Data Bates Distribution Method: Third-party Price: \$2,595

Modern Class: Long-Haul Transmission Technique: Synchronous insmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 208 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer ution Method: Third-party Price: \$1,750

Number Installed to Date: 500 -

Date First installed: January 1982

PENRIL CORP.

8201 A/B

1.000

PENRIL CORP. 8201 DN/PL Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -1,200 bos, 2,400 bos Interface: RS-232C, CCITT V.24. CCITT V.26, CCITT V.28 Bell-Compatible: 201
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Switchable Data Rates Distribution Method: Third-party Price: \$785 to \$795 Number Installed to Date: 1,000 -5 000 Date First Installed: February 1981

DEMBU CORP.

8192 Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Hatf-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14 400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Nonloaded Cable Features: Autoequalizer. Diagnostics Distribution Method: Third-party Price: \$535 Number Installed to Date: 500 -

Date First Installed: October 1981

PENRIL CORP.
PSH-96A
Modem Classe: Short-Haul
Transmission Technique:
Asynchronous
Transmission Node: Hall-Duplex,
Full-Duplex, Simplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps, 1,200
bps, 1,900 bps, 2,400 bps, 1,920
bps, 1,900 bps, 2,400 bps, 1,920
bps
Interface: RS-232C, CCITT V.24.
CCITT V.28, 20 mA Current Loop
Transmission Medium: Nonioaded
Cable

Transmission Medium: Nonloaded Cable Diagnostics: No Distribution Method: Third-party Price: \$250 Number Installed to Dete: 5,000 -10,000 Date First Installed: Soptember 1976

8801C
Modern Class: Autocall Unit
Interface: RS 368
Bell-Compatible: 801C
Transmission Medium: Voice-Grade
Lines
Features: Autoclal
Distribution Method: Third-party
Price: \$675
Number Installed to Date: Under
100
Date First Installed: June 1980

PENNIL CORP.
MCU 4B
Modem Class: Port-Sharing
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Interface: RS-232C, CCITT V.24
Diagnostics: No
Distribution Method: CEM
Price: \$440
Number Installed to Date: Under
100
Date: Strait Installed: June, 1974

PHALO CORP.

ODS-201
Modern Clasas: Fiber-Optic
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-Up to 100K bps
Interface: RS-232C
Transmission Medium: Fiber Optics
Features: Diagnostics,
Remotel\_Local Loopback
Distribution Method: End user
Price: \$625
Date First Installed: 1981
(See Vendor Profile Page V-23)

PHALO CORP. ODS-209 Modern Class: Fiber-Optic Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2 400 bos 4 800 bos 9 600 bos 14,400 bps, 19,200 bps; Synchronous - 56,000 bps Interface: RS-232C, RS-449, V.35 Transmission Medium: Fiber Optics Diagnostics: No Features: Remote/Local Loopback Distribution Method: End user Price: \$725 Date First Installed: 1981

PMALO CORP.

ODS-308
Modem Class: Fiber-Optic
Transmission Technique:
Asynchronous, Synchronous
Transmission Moder: Full-Duplex
Transmission Medier: Synchronous 2,000 to 40K bps
Interface: RS-449, V.35
Transmission Medium: Fiber Optics
Diagnostics: No
Features: Remote/Local Loopback
Distribution Method: End user, OEM
Price: \$1,750
Date First Installed: 1982

PRENTICE CORP.
ALD/1
Modern Class: Line Driver
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps, 2,400 bps, 4,800
bps, 9,800 bps

Interface: RS-232C, CCITT V.24, 20 MA Current Loop
Transmission Medium: Twisted-Pair Features: Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$200 to \$300 Number Installed to Date: 10,000 -50,000 Date First Installed: June 1977 (See Vendor Profile Page V-24)

#### PRENTICE CORP Modern Class: Line Driver Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-in Features: Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$390 to \$490 er installed to Date: 5,000 -

PRENTICE CORP. 212 TCM Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 1,200 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines

Date First Installed: January 1977

10,000

Diagnostics: Yes; Built-in Features: Autodial, Autoanswer Alternate Voice/Data, Diagnostics, Switchable Data Rates, Stored **Autodial Directory** Distribution Method: Third-party Price: \$695 to \$795 Number installed to Date: 500 -1.000 Date First Installed: 1982

PRENTICE CORP 9600A/B Modem Class: Long-Haul Transmission Technique:

Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines

Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Fallback, Switchable **Data Rates** Distribution Method: Third-party

Price: \$2 995 Date First Installed: January 1984

PRENTICE CORP. 9629 Modern Class: Long-Haul Transmission Technique: Synchronous namission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Transmission Madium: Voice-Grade Lines Diagnostics: Yee; Built-in Features: Autoequalizer, Diagnostics, Fallback, Switchable

Distribution Method: Third-party Price: \$2.650 to \$2.750 Number Installed to Date: Under Date First Installed: November 1983

PRENTICE CORP. P-V 22 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous

110 bps, 300 bps; Asynchronous/ Synchronous - 600 bps, 1,200 bps interface: RS-232C, CCITT V.22. CCITT V.24, CCITT V.28 Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in

Features: Autoanswer, Alternate Voice/Data, Diagnostics, Fallback. Switchable Data Rates Distribution Method: OEM Price: \$695 to \$795 Number Installed to Date: 1,000 -Date First Installed: March 1981

PRENTICE CORP.

P-201C

Modern Class: Long-Haul Transmission Technique: Synchronous Full-Duplex, Simplex Transmission Rate: Synchronous -2,400 bos Interface: RS-232C, CCITT V.24 Bell-Compatible: 201
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: Third-party Price: \$695 to \$795 Number installed to Date: 1,000 -5.000

Date First Installed: April 1981

PRENTICE CORP. P-202T Modem Class: Long-Haul Transmission Technique: Asynchronous namission Mode: Half-Duplex, Full-Duplex, Simplex smission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps. 1,800 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes: Built-in res: Diagnostics, Switchable Data Rates
Distribution Method: Third-party Price: \$295 to \$395 er installed to Date: 1,000 -5,000 Date First Installed: September

PRENTICE CORP. P-208A/B Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex ission Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 208
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer,

Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: Third-party Price: \$1,650 to \$1,750 Number installed to Date: Under Date First installed: September

PRENTICE CORP. P-212 Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1.200 bns Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 208 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$495 to \$595 Number installed to Date: 5,000 -10.000 Date First Installed: June 1980

PRENTICE CORP. TRIMODEM

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 212, VA 3400 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates

Distribution Method: Third-party Price: \$850 to \$950 Number installed to Date: 500 -1.000

Date First Installed: February 1982

4011-10 (108C) RECEIVER

Modem Class: Long-Haul Transmission Technique: Asynchronous emission Mode: Half-Duplex, Full-Duplex sion Rate: Asynchronous -Trans Up to 300 bps rface: RS-232C, MIL 188-100 Interface: RS-232C, MIL 188-100 Bell-Compatible: 108C Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in Features: Diagnostics, Line Impedence Match Distribution Method: End user, OEM, Third-party **Price: \$351** nber installed to Date: 1.000 -

Date First Installed: 1976 (See Vendor Profile Page V-24)

4012-10 (108A) TRANSMITTER Modern Class: Long-Haul Transmission Technique: Asynchronous ion Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -Up to 300 bps Interface: RS-232C, MIL 188-100 Bell-Compatible: 108A Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Switchable Data Rates. Line Impedence Match Distribution Method: End user. OEM, Third-party Price: \$351

Number Installed to Date: 1,000 -5.000 Date First installed: 1976

RACAL-MILGO, INC. 24 LSI MARK II Modern Class: Long-Haul Transmission Technique: Synchronous sion Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -2,400 bps Interface: RS-232C, CCITT V.24, CCITT V 28 Bell-Competible: 201B, 201 Transmission Medium: Voice-Grade Features: Autoequalizer, Autoanswer, Diagnostics Distribution Method: End user

(See Vendor Profile Page V-24) RACAL-MILGO, INC. CMS 12 Modern Class: Long-Haul Transmission Technique: Asynchronous nsmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade

Price: \$1.450 to \$2.050

Diagnostics: Yes; Built-in Features: Diagnostics, Dial Back-up Distribution Method: End user Price: \$1,900 to \$2,050

RACAL-MILGO, INC.
CASS 24 Modern Cleas: Long-Haul Transmission Technique: Synchronous Transmission Mode: Hall-Duplex, Full-Duplex, Full-Duplex Transmission Rate: Synchronous 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Diagnostics, Diel Back-up Features: Diagnostics, Diel Back-up Features: Diagnostics, Diel Back-up

RACAL-MILLOO, INC.
MODEM 58K
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Moder: Full-Duplex
Transmission Modes: Full-Duplex
Transmission Reds: Synchronous 56,000 bps
Interface: CCITT V.35
Transmission Medium: Wide-Band

Distribution Method: End user

Price: \$2,200

Lines Diagnostica: Yes; Bulk-in Features: Statistical Equalizer Distribution Method: End user Price: \$8,000 to \$8,250

RACAL-MILGO, INC. MODEM 112K Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 112K bps Interface: CCITT V 35 Transmission Medium: Wide-Band Lines Diagnostics: Yes: Built-in Features: Diagnostics, Fallback, Statistical Equalizer Distribution Method: End user Price: \$16.500 to \$17.400

RACAL-MILGO, INC. MPS 14.4K

Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -19,200 bos Interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autoequalizer, Diagnostics, Multiport, Fallback, Switchable Data Rates, Individual Port Carrier Center Distribution Method: End user

RACAL-MILGO, INC. OMNIMODE CS (CENTRAL SITE) Modem Class: Long-Haul

Price: \$10,000 to \$12,400

Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Synchronous
4,800 bps, 9,600 bps
Interface: RS-232C, CCITT V.24,
CCITT V.27, CCITT V.28
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes: Bult-in
Features: Autoroqualizer,
Diagnostics, Fallback, Switchable
Data Rates
Distribution Method: End user
Price: \$2,100 to \$3,600

Date First installed: 1983

RACAL-MILGO, INC.

OMMINIOCE 48
Modern Cleas: Long-Haul
Transmission Tschnique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Synchronous 4,800 bp s
Interface: R8-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines
Feetures: Autoequalizer,
Diegnostics, Multiport, Fallback,
Switchable Data Rates, Front Panel
Information

Distribution Method: End user Price: \$2,450 to \$4,150 Number Installed to Date: 500 -1,000 Date First Installed: 1982

RACAL-MILGO, INC.
OMNIMOCE 98
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous 9,600 bps
Interface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Voice-Grade
Lines
Transmission Medium: Voice-Grade
Lines
Synchrobic Data Rates, Front Panel

Switchable Data Hates, Front Pani Information Distribution Method: End user Price: \$4,150 to \$5,850 Number Installed to Date: 500 -1,000

Date First installed: 1983

RACAL-MILGO, INC.
COM LINK III
Modem Clans: Short-Haul
Transmission Technique:
Synchronous
Transmission Rate: Synchronous
1,200 bps, 1,800 bps, 2,400 bps,
4,800 bps, 9,600 bps, 14,400 bps,
4,800 bps, 9,600 bps, 14,400 bps,
Haynchronous/Synchronous - 1,200
bps, 19,200 bps
Interface: RS-232C, CCITT V.24
Transmission Medium: 4-Wire
Twistod-Pair
Diagnostics: Yes; Bulli-In
Features: Diagnostics

Distribution Method: End user Price: \$920 to \$945

RAGAL-VADIC
VA3413
Modem Class: Coupler
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
110 bps; 300 bps; Asynchronous/
Synchronous - 1,200 bps
Interface: R5-232C

Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade Lines Features: Diagnostics Distribution Method: Third-party Price: \$695 (See Vendor Profile Page V-25)

RACAL-VADIC
VA103 MODEMPHONE
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines

Features: Autodial, Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: Third-party Price: \$250 to \$380 Date First Installed: 1980

RACAL-VADIC
VA212 AUTO DIAL
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
-110 bps, 300 bps; Asynchronous
-110 bps, 300 bps; Asynchronous
-10 bps; 300 b

RACAL-VADIC VA212 PAR AUTO DIAL Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps; Asynchronous/ Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Features: Autodial. Diagnostics. Switchable Data Rates
Distribution Method: Third-party Price: \$695 Date First Installed: 1983

RACAL-VADIC VA212LC Modern Class: Long-Hauf Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Mate: Asynchronous
110 bps, 300 bps: Asynchronous
110 bps, 300 bps: Asynchronous/
Synchronous - 1,200 bps
Interface: RS-232C
Bell-Competible: 103, 212
Transmission Medium: Voice-Grade
Lines
Features: Autodial, Autoanswer,
Diagnostics, Handshaking
Distribution Method: Third-party
Price: \$495
Date Test Installed: September
1985

RACAL-VADIC VA315 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer, Diagnostics Distribution Method: End user Price: \$375 Date First Installed: 1981

RACAL-VADIC
VA317
Modem Cless: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
110 lps, 300 lps;
Interface: R5-232C
Bell-Compatible: 113
Transmission Medium: Voice-Grade
Lines
Switchable Data Rates
Distribution Method: Third-party
Price: \$250
Date First Installed: 1976

WAGAL-VANDE
VA385
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Rate: Asynchronous110 bps, 300 bps
Interface: RS-232C, 20 mA Current
Loop
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Features: Alternate Voice/Data,
Diagnostics
Distribution Method: Third-party
Price: \$375
Date First Installed: 1977

RACAL-VADIC
VA1205/30 SERIES
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex

Transmission Rate: Asynchronous-110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 1,200 bps, 1,800 bps, 1,200 ps, 1,800 bps, 1,200 ps, 1,800 bps, 1,200 ps, 1,800 bps, 1,800 ps, 1,800 ps,

#### RACAL-VADIC

RACAL-VADIC VA1250 SERIES DIRECT-

VA1240
Modem Cleas: Long-Haul
Trensmission Technique:
Asynchronous, Sporhronous
Trensmission Mode: Half-Duplex,
Full-Duplex
Trensmission Rate: Asynchronous/
Synchronous - 600 bps, 1,200 bps

Interface: RS-232C, CCITT V.24
Bell-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Features: Diagnostics

Features: Diagnostics
Distribution Method: Third-party
Price: \$290

CONNECT
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex
Transmission Rate: Asynchronous
Transmission Bate: Asynchronous
Transmission Bate: Asynchronous
Interface: RS-232C
Bell-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Features: Alternate Voice/Data,
Reverse Channel, Diagnostics
Distribution Method: Third-party
Date First Installect: 1978

RACAL-VADIC VA1250 SERIES OF LEASED-LINE MODEMS Modem Class: Long-Haul Transmission Technique:

Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200

bps, 1,800 bps interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines

Peatures: Autoanswer, Reverse Channel, Diagnostics Distribution Method: Third-party Price: \$425 to \$550 Date First Installad: 1978

RACAL-VADIC
VA2430 G/K
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Synchronous 2,400 bps
Interface: R8-232C, CCITT V.26

Bell-Compatible: 201

Featuree: Autoequalizer, Reverse Channel, Diagnostics Distribution Method: Third-party Price: \$500 Date First Installed: 1976

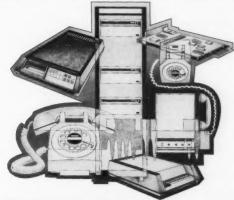
PACAL-VADIC VA2440/45 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Dupis

Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines

Features: Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$575 to \$725

RACAL-VADIC VA2450 SERIES Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Ratie: Asynchronous/ Synchronous - 2,400 bps Bell-Compatible: 201 Transmission Medium: Voice-Grade Feetures: Alternate Voice/Data, Reverse Channel, Diagnostics Distribution Method: Third-party Price: \$725 to \$875

RACAL-VADIC VA3451 TRIPLE MODEM Modem Class: Long-Haul Transmission Technique: Asynchronous



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Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -10 bps, 300 bps 1,200 bps Bell-Competible: 103, 212 Fisehäres: Autocial, Autoanswer, Alternate Volce/Data, Diagnostics Distribution Method: Third-party Price: SSTS

#### RACAL-VADIC

VRA345 Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Resiz: Asynchronous - 1,200 bps Synchronous - 1,200 bps Interface: RS-232C Transmission Redium: Voice-Grade Lines Features: Autoenswer, Alternate Voice/Data, Diagnostics Distribution Method: Third-party Price: \$775 Mumber Installed to Date: 5,000 - 10,000 Date First Installed: 1977

#### RACAL-VADIC

VA3467 Modern Class: Long-Haul Transmission Technique Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps: Asynchronous Synchronous - 1,200 bos Interface: RS-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Diagnostics, Switchable Data Rates Distribution Method: Third-party Date First Installed: 1977

#### RACAL-VADIC

**VA3480 SERIES** Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Dupley Transmission Rate: Asynchronous -300 bps; Asynchronous Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Features: Autoenswer, Disonostics Distribution Method: Third-party Price: \$950 Date First Installed: 1981

#### RACAL-VADIC VA4400 SERIES Modern Class: Long-Haul

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Asynchronous, Synchronous Transmission Medie: Full-Duplex Transmission Medie: Asynchronous - 1,200 bps, 2,400 bps Initiatrace: R5-232C Bell-Compatible: 103, 212 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoequalizer, Autoanswer, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$1,745 to \$1,945

#### RACAL-VADIC VA4840 SERIES

Synchronous

Price: \$1,350

Modern Class: Long-Haul

Transmission Technique:

Transmission Mode: Half-Duplex, Ful-Duplex, Ful-Duplex, Ful-Duplex, Transmission Rate: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Belf-Compatible: 208 Transmission Medium: Voice-Grade Lines Diagnostics: Yee; Bullf-restures: Autocial, Autocqualizer, Autoenswer, Diagnostics plastribution Method: Third-party Distribution Method: Third-party

#### Date First Installed: 1982 RAYCOM SYSTEMS, INC.

Modern Class: Fiber-Optic Transmission Techniqu Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps. 9.600 bps. 14.400 bps. 19.200 bps, 56,000 bps, 100K bps Interface: RS-232C Transmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Diagnostics **Distribution Method: OEM** Price: \$250 Number installed to Date: Under Date First Installed: October 1983 (See Vendor Profile Page V-00)

#### RAYCOM SYSTEMS, INC.

Modern Class: Fiber-Optic Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Synchronous -1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - 2,500 Interface: Coaxial Connector RG-62 Transmission Medium: Fiber Optics Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: OEM Price: \$350 Number Installed to Date: Under Date First Installed: March 1984

#### RAYCOM SYSTEMS, INC. 3000 Modern Class: Fiber-Optic

Trensmission Technique: Synchronous Trensmission Mode: Full-Duplex Transmission Rate: Synchronous 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - 2,500 bps interface: RS-232C, RS-422 Transmission Medium: Fiber Optics Features: Diagnostics, Clock Calender, Switchable Data Rates Diaribution Method: OEM Price: \$320.

Number Installed to Date: Under

## RFL INDUSTRIES

Modern Class: Long-Haul Transmission Tachique: Asynchronous Mode: Full-Duplex Transmission Mate: Full-Duplex Transmission Rate: Asynchronous -1,200 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Distribution Method: OEM

Distribution Method: OEM Price: \$390 Number installed to Date: 1,000 -5,000 Date First Installed: January 1977 (See Vendor Profile Page V-25)

#### RFL INDUSTRIES 6860 Modem Class: Long-Haul Transmission Technique:

Asynchronous

Transmission Rate: Asynchronous - 1,200 bps Interface: RS-252C Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Alternate Voice/Data Distribution Method: OEM Price: \$3,800 Number Installed to Date: Under

Date First Installed: January 1981

Transmission Mode: Full-Duplex

#### RIXON, INC. OEM 212A FOR CUSTOM APPLICATIONS

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 300; Synchronous - 1,200 bps Interface: RS-232C, TTL Bell-Compatible: 103, 113, 212 Transmission Medium: Voico-Grade Lines Diagnostica: Yes; Built-In Features: Autodia, Alternate voico/Data, Diagnostics Distribution Method: End user, Third-party (See Vendor Profile Page V-25)

#### RIXON, INC. PC 212A MODEM FOR IBM PC AND PC-XT Modem Class: Long-Haul

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous - 300 bps, 1,200 bps Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autodial, Autoanswer, Alternate Voice/Data, Switchable Data Rates Distribution Method: End user, Third-party Price: \$499

Date First Installed: March 1983

RIXON, IMC.
R14.4 MODEM
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous
9,600 bps, 19,200 bps
Interface: RS-232C
Transmission Medium: Voice-Grade
Lines
Diagnostica: Yes; Built-in
Features: Autoequalizer,
Diagnostica: Multiport, Fallback
Diagnostica: Multiport, Fallback
Diagnostica: Foliagnostica: Foliagnostica: Multiport, Fallback
Diagnostica: Multiport, Fallback
Diagnostica: Foliagnostica: Foliag

#### RIXON, INC. R103J LSI MODEM Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex

Transmission Rate: Asynchronous -300 bps interface: RS-232C Bell-Competible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-In

Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user, Third-party

#### RIXON, INC. R212A INTELLIGENT MODEM Modem Class: Long-Haul

Asynchronous Transmisaion Mode: Full-Duplex Transmisaion Rate: Asynchronous -300 bps. 1,200 bps. Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmisaion Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autocial, Autoanswer, Atternate Voice/Data. Diagnostics

Distribution Method: End user,

#### RIXON, INC. R212A LSI MODEM

Third-party

R212A LSI MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Made: Full-Duplex
Transmission Rate: Asynchronous 300 bps: Synchronous - 1,200 bps
Interface: R5-232C
Bell-Compatible: 103, 212
Transmission Medium: Voico-Grade

Diagnostics: Yes; Built-in Features: Autodial Autoenswer Alternate Voice/Data, Diagnostics Distribution Method: Third-party

BIXON, INC. **B2424 LSI MODEM** Modern Class: Long-Haul Transmission Technique: Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.24, CCITT V.28 Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in

itures: Autoanswer, Alternate

Voice/Data, Diagnostics Distribution Method: End user.

Third-party

Fallback

Third-party

RIXON, INC. RV .29/2 MODEM SYSTEM Modern Class: Long-Haul Transmission Technique: Synchronous ission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -4.800 bps, 9,600 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostica: Yes; Built-in Features: Autoequalizer, Diagnostics, Multiport,

Distribution Method: End user,

RIXON, INC. T103J LSI MODEM Modern Class: Long-Haul Transmission Technique Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 103, 113, 212
Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Reverse Channel, Diagnostics
Distribution Method: End user, Third-party

RIXON, INC. T108 LSI DATA MODEM Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 100 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Alternate Voice/Data, Diagnostics Distribution Method: End user, Third-party

RIXON, INC. T113C LSI DATA MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interfece: RS-232C Bell-Competible: 103, 113, 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Alternate Voice/Data. Diagnostics stribution Method: End user. Third-party

RIXON, INC. T202S LSI DATA MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -1.200 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer. Alternate Voice/Data, Reverse Channel, Diagnostics
Distribution Method: End user. Third-party

Modern Class: Long-Haul Transmission Technique: Asynchronous namission Mode: Half-Duplex, Full-Dunley Transmission Rate: Asynchronous -1,800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Reverse Channel, Diagnostics
Distribution Method: End user. Third-party

RIXON, INC.

RIXON, INC. T202T LSI DATA MODEM

T212A LSI DATA MODEM Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 300 bps; Synchronous - 1,200 bps Interface: RS-232C Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Fallback Distribution Method: End user. Third-party

RIXON, INC. TA 208A/B LSI MODEM Modern Class: Long-Haul Transmission Technique: Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps 4,000 pps Interface: RS-232C Bell-Compatible: 208, 208B Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer. Autoanswer, Alternate Voice/Data. Diagnostics Distribution Method: End user.

Third-party

RIXON, INC.

RIXON, INC. LOM 710 LIMITED-DISTANCE DATA MODEM Modern Class: Short-Haul mission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -9,600 bps Interface: RS-232C Transmission Mediu Metallic Cable Pair m: Nonload Diagnostics: Yes; Built-in Features: Diagnostics Distribution Method: End user. Third-party

LDM 720 LIMITED-DISTANCE DATA MODEM Modern Class: Short-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Dunley Transmission Rate: Synchronous -1,800 bps, 2,400 bps, 4,800 bps, 9.600 bps. 14.400 bps. 19.200 bps: Asynchronous/Synchronous - 3,600

Interface: RS-232C Transmission Medium: Nonload Metallic Cable Pair Diagnostics: Yes; Built-in Features: Autoequalizer Distribution Method: End user, Third-party

**ROCKWELL INTERNATIONAL R24 THREE MODULE SET** Modern Class: Long-Haul Synchronous Transmission Mode: Half-Duplex. Full-Duplex nission Rate: Synchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.26 Bell-Compatible: 201 Transmission Medium: Voice-Grade

Diagnostics: Yes; Add-on Features: Switchable Data Rates Distribution Method: OEM, Third-Date First Installed: 1980 (See Vendor Profile Page V-25)

ROCKWELL INTERNATIONAL R24DC Modem Class: Long-Haui Transmission Technique:

Transmission Mode: Half-Duplex Transmission Rate: Synchronous -1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.26 Bell-Compatible: 201
Transmission Medium: Voice-Grade Diagnostics: Yes; Add-on Features: Autodial, Autoanswer, Switchable Data Rates
Distribution Method: OEM, Thirdto Street toostalland: 1981

ROCKWELL INTERNATIONAL R24LL Modern Class: Long-Haul Transmission Technique: Synchronous namission Mode: Half-Duplex. Full-Duplex salon Rate: Synchronous -Trens 1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.26 Bell-Compatible: 201, 201 B/C Transmission Medium: Voice-Grade erface: RS-232C, CCTT V.26 Lines Diagnostics: Yes; Add-on Features; Switchable Date Features: Switchable Data Rates Distribution Method: OEM, Thirdparty Date First Installed: 1982 **ROCKWELL INTERNATIONAL** 

R48DP Modern Class: Long-Haul on Technique Synchronous Transmission Mode: Half-Duplex, Full-Duplex nission Rate: Synchronous -2,400 bps, 4,800 bps Interface: RS-232C, CCITT V.24, CCITT V.27 Bell-Compatible: 208 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in
Features: Autosqualizer;
Diagnostics, Switchable Data Rates
Distribution Method: OEM, Third-

ROCKWELL INTERNATIONAL R96DP Modern Class: Long-Haul Transmission Technique: Synchronous ansmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.29 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Switchable Data Rates Distribution Method: OEM, Third-

**ROCKWELL INTERNATIONAL** Modem Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex Transmission Rate: Synchronous - 300 bps, 2,400 bps, 9,600 bps Interface: RS-232C, CCITT V.24, CCITT V.27, CCITT V.29 sion Medium: Voice-Grade Transc Lines Diagnostics: Yes: Built-in Features: Autoequalizer, Diagnostics, Switchable Data Rates Distribution Method: Third-party Date First Installed: 1963

ROCKWELL INTERNATIONAL R96FT

Modern Class: Long-Haul ion Technique: Transmiss Synchronous ineine Mode: Half-Duniex. Transa Full-Duplex Transmission Rate: Synchronous -110 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24. CCITT V.27, CCITT V.29 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Feetures: Autoequalizer,

Diagnostics, Switchable Data Rates Distribution Method: OEM ROCKWELL INTERNATIONAL Modern Class: Long-Haul

Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.22. CCITT V.24, CCITTV.22BIS Bell-Competible: 103, 212, 212A Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OEM, Thirdparty

#### **ROCKWELL INTERNATIONAL** R1212DC

Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1,200 bos meriace: RS-232C, CCITT V.22, CCITT V.24 Beil-Competible: 103, 212, 212A Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Bult-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: OEM, Third-

**ROCKWELL INTERNATIONAL** R1212M

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1,200 bos Interface: RS-232C, CCITT V.22, CCITT V.24 Bell-Competible: 103, 212, 212A Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer. Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates ribution Method: OEM. Thirdparty

**ROCKWELL INTERNATIONAL** R2424DC Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 300 bps, 600 bps, 1,200 bps, 2,400 bps Interface: RS-232C, CCITT V.22, CCITT V.24, CCITT V.22BIS Bell-Compatible: 103, 212, 212A Transmi\_sion Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autodial. Autoequalizer. Autoanswer, Alternate Voice/Data, Diagnostics, Switchable Data Rates ibution Mathod: OEM. Thirdparty

**ROCKWELL INTERNATIONAL** 

Modern Class: Long-Haul Transmission Technique: Synchronous mission Mode: Half-Duplex, Full-Dunley Transmission Rate: Synchronous -300 bps, 2,400 bps, 4,800 bps Interface: RS-232C, T.30 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Add-on Features: Autoequalizer, Switchable Data Rates Distribution Method: OEM Date First Installed: 1981

**ROCKWELL INTERNATIONAL** 

V96P/1 Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Synchronous -300 bps, 2,400 bps, 4,800 bps, 9.600 bps Interface: RS-232C, CCITT V.27. CCITT V.29 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Add-on Features: Autoequalizer, Switchable Data Rates

SCHNEIDER INSTRUMENT CO. MCT-2

Distribution Method: OEM Date First Installed: September

Modern Class: Digital Transmission Technique: Asynchronous

Transmission Mode: Half-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Transmission Madium: Voice-Grade Diagnostics: No Features: Autodial, Autoanswer, Clock Calendar, Switchable Data Distribution Method: End user Price: \$3,425

Number Installed to Date: Under 100 Date First Installed: January 1980 (See Vendor Profile Page V-26)

SCIENTIFIC ATLANTA, INC. 6402 Modern Class: Short-Haul

Transmission Technique: Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - T-1 Interface: RS-449, RS-422, DS1 Transmission Medium: Coaxial Lines Diagnostics: Yes; Built-in
Features: Diagnostics
Distribution Method: End user, OEM

Price: \$4,000 Number Installed to Date: Under 100 Date First Installed: December 1982

(See Vendor Profile Page V-26) SCIENTIFIC RADIATION 5010 SERIES OPTICAL DATA LINK

Modern Class: Short-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -2,400 bos Interface: RS-232C Transmission Medium: Free Air Diagnostics: No Distribution Method: End user. Third-party

Price: \$289 to \$338 Number Installed to Date: Under 100 Date First installed: 1980 (See Vendor Profile Page V-26)

SEISCORP, INC. **IDBC 9600 SERIES** Modem Class: Short-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 9,600 bps Interface: RS-232C Transm itaaton Madium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer,

Simultaneous Voice/Data Distribution Method: End user Price: \$500 Number installed to Date: 100 - 500 Date First Installed: January 1983 (See Vendor Profile Page V-26)

Autoanswer, Alternate Voice/Data,

Diagnostics, Multiport, Fallback,

Switchable Data Rates,

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex mission Rate: Asynchronous -300 hos Interface: RS-232C Bell-Competible: 103 Transmission Medium: Voice-Grade l ines Diagnostics: No Features: Autoanswer, Reverse Channel Distribution Method: OEM Price: \$250 Number Installed to Date: Under

SONEX, INC.

100 Date First installed: January 1972 (See Vendor Profile Page V-28)

SONEX, INC. 2202 Modern Class: Long-Haul Transmission Technique: Asynchronous namission Mode: Half-Duplex. Full-Dunley Transmission Rate: Asynchronous -1,200 bps, 1,800 bps Interface: RS-232C Bell-Compatible: 202 Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoanswer Distribution Method: OEM Price: \$400 Number installed to Date: Under 100

SONEX, INC. 2407 Modern Class: Long-Haul Interface: RS-232C Bell-Compatible: 407E Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Autoanswe

Date First installed: January 1972

Distribution Method: OEM Price: \$500 Number installed to Date: 500 -

SPERRY CORP.
DATA COMMUNICATION MODULE (TYPE 8610) lodem Class: Modern Eliminator Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps; Asynchronous/ Synchronous - 2,400 bps, 4,800 bps, 9,600 bps; Synchronous - 7,200 bps, 14.400 bos Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: No Features: Diagnostics, Switchable Data Rates

Distribution Method: End user Price: \$852

party

Number Installed to Date: 1,000 - 5,000 Date First Installed: 1981 (See Vendor Profile Page V-28)

TAMDY CORP.

AC- 28-1174
Modem Class: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Transmission Rate: Asynchronous300 bps Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Linos
Diagnostics: No
Disgnostics: No
Disgnostics: No
Disgnostics: End user

Price: \$149

TABET CORR.
78-1005/1009 (ACU)
Modem Class: Long-Haul
Transmission Technique:
Asynchronous Synchronous
Transmission Rate: Asynchronous
300 bps; Asynchronous/
Synchronous - 1,200 bps
Interface: RS-232C
Bell-Compatible: 103, 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Diag

(See Vendor Profile Page V-29)

TANDY CORP.
DC MODEM IB 28-1175
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Features: Direct Connect
Distribution Method: End user

Price: \$699 to \$848

TANDY CORP.
DC MODEM II 26-1173
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostica: Yes; Add-on
Festures: Autocial, Autoanswer,
Remotel/Local Loopback

TEK-COM, INC. TC3001 Modern Class: Coupler

Price: \$199

Distribution Method: End user

Transmission Technique:
Asynchronous
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C, 20 MA Current
Loop
Belf-Competible: 103
Transmission Medium: Volce-Grade
Lines
Distribution Method: End user
Price: \$195 to \$265
Date First Installed: 1979
(See Vexion Profile Page V-30)

(See Vendor Profile Page V-30)

TEX-COE, INC.
TC3002

Modem Class: Coupler
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rets: Asynchronous
300 bps
Interface: RIS-232C, 20 MA Current
Loop
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Feethures: Autodial
Distribution Method: OEM

TEIX-COM, INC.
TC3006
Modern Cleas: Coupler
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Fastures: Autoanswer
Price: \$195
Date First Installact: September
1979

Price: \$265

Date First Installed: 1979

4700 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps Interface: RS-232C Bell-Competible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics, Fallback Distribution Method: OEM, Thirdparty Price: \$365 Number installed to Date: 500 -1.000 Date First Installed: May 1982

TEK-COM, INC.

TEK-COM, INC. TC5001 Modern Class: Long-Haul Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous110 bps, 300 bps, 600 bps, 1,200
bps, 1,000 bps, 1,200
bps, 1,000 bps, 1,200
breafface: RS-232C, CCITT V.24,
CCITT V.28
Transmission Medium: Volce-Grade
Lines
Diagnostics: Yes; Built-in
Features: Diagnostics

TELEBYTE TECHNOLOGIES. 72D. VT-100 COMPATIBLE SHM Modern Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -14,400 bps Interface: RS-232C Bell-Compatible: 43401 Transmission Medium: Metallic Pairs Diagnostica: No Features: Reverse Channel, Switchable Data Rates, DEC VT-100 Compatible Distribution Method: Third-party Price: \$130 Number Installed to Date: Under 100 Date First Installed: June 1983 (See Vendor Profile Page V-30)

(See Vendor Profile Page V-30)

TELEBYTE TECHNOLOGIES,
INC.
74A SHORT-HAUL MODEM WITH
HANDSHAKE
Modem Class: Line Driver
Transmission Technique:
Asynchronom Rate: Asynchronous 14.400 bps
Interface: RS-232C
Bell-Compatible: 43401
Transmission Medium: Metallic
Pairs

Transmission seculiar: Netaliac Pairs Diagnostics: No Features: Reverse Channel, Switchable Data Rates, Bidirectional Control Distribution Method: OEM Price: \$185 Number Installed to Date: 100 - 500 Date First Installed: January 1983

TELEBYTE TECHNOLOGIES, 1MC.
1MC.
79 DUAL SHORT-HAUL MODEM WITH HANDSHAKE Modem Class Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous 14,400 bps Bell-Competible: 43401 Transmission Medium: Metallic Pairs Diagnostics: Yes; Built-in

Pairs
Diagnostics: Yes; Built-in
Features: Reverse Channel,
Diagnostics, Fallback, Switchable
Data Rates, Bidirectional Control
Distribution Method: End user

Price: \$225 Number Installed to Date: Under 100 Date First Installed: January 1984 TELEBYTE TECHHOLOGIES.

71
Modern Class: Short-Hauf
Transmission Technique:
Asynchronous
Asynchronous
Transmission Relate: Asynchronous-Internation: Relate: No Features: Reverse Charmel, Switchalbo Data Rates
Distribution Method: End user
Number Installed to Date: 1,000 -

5 000

TELEBYTE TECHNIOLOGIES, INC.
72
Modern Class: Short-Haul
Transmission Technique:
Asynchronous
Asynchronous Transmission Mode: Full-Duplex
Transmission Rete: Asynchronous 14,400 bps
Interfacus: RS-232C
Bell-Compatible: 43401
Transmission Medium: Metallic
Pairs
Diagnostics: No
Features: Reverse Channel,

Date First Installed: February 1982

Peatures: Reverse Channel,
Switchable Data Rates, DTE/DCE
Selectable
Distribution Method: Third-party
Price: \$125
Number Installed to Date: 1,000-5,000
Date First Installed: February 1982
TELEBYTE TECHNOLOGIES.

73 REMOTELY CONTROLLED SHM
Modem Class: Short-Haul
Transmission Technique:
Asynchronous
Asynchronous
Transmission Rate: Asynchronous 14,400 bps
Interface: RS-232C
Bell-Compatible: 43401
Transmission Medium: Motallic
Pairs
Features: Reverse Chennel,
Switchable Data Rates, Host
Powered
Distribution Method: End user
Number installed to Date: Linder

Date First Installed: November 1982
TELEBYTE TECHNOLOGIES,
INC.
75 DUAL SNORT-HAUL MODEM
Modem Cleas: Short-Hauf
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplax
Transmission Rate: Asynchronous -

14,400 bos

Bell-Compatible: 43401
Transentiasion Medium: Metallic
Pairs
Diagnostica: Yes; Built-in
Peatareas: Reverse Channel,
Diagnostica, Fallback, Switchable
Data Rates
Distribution Method: End user
Price: \$185
Number Installed to Date: 100 - 500
Date Pints Installed: October 1982

TELEPROCESSINO PRODUCTS, INC. TP-500 Modern Clean: Digital (DSL)) Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex mission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Transmission Medium: Digital Termination Diagnostics: Yes; Built-in Features: Diagnostics, Multiport, Fallback, Switchable Data Rates Distribution Method: End user Price: \$495 to \$650 Number installed to Date: 500 -1.000 Date First Installed: June 1983 (See Vendor Profile Page V-30)

TELEPROCESSING PRODUCTS, INC. TP-501 Modem Class: Digital **Transmission Tech** Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex mission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C Transmission Medium: Digital Termination Diagnostics: Yes; Built-in Feetures: Autoequalizer. Diagnostics, Multiport, Fallback, Switchable Data Rate Distribution Method: End user Price: \$865 to \$1,025 Number Installed to Date: Under 100 Date First Installed: January 1984

TELEPROCESSING PRODUCTS, INC. TP-556 Modern Class: Digital Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -14.400 bps, 56,000 bps Interface: V.35 Transmission Medium: Digital Termination Diagnostics: Yes; Built-in Features: Diagnostics, Multiport, Fallback, Switchable Data Rates Distribution Method: End user Price: \$595 to \$750 Number installed to Date: 100 - 500 Date First installed: August 1983

PRODUCTS, INC. TP-557 Modern Class: Digital Transmission Technique: Synchronous Transmission Mode: Half-Duplex. Full-Duplex, Simplex Transmission Rate: Synchronous -14,400 bps, 56,000 bps Interface: V.35 Transmission ## Termination Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user Price: \$890 to \$1,095 Number Installed to Date: Under Date First Installed: January 1984

TELEPROCESSING

TELEPROCESSING PRODUCTS, INC. TP-232 Modern Class: Modern Fliminstor Transmission Technique: Asynchronous, Synchronous remission Mode: Half-Duplex Full-Duplex, Simplex Transmission Rate: Asynchronous/ Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Transmission Medium: Twisted-Pair Diagnostics: Yes; Built-in Features: Autodial, Autoanswer Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$395 Number installed to Date: 500 -1.000 **Date First Installed: September** 

1976

YELEPROCESSING PRODUCTS, INC. TP-550 Modem Class: Channel Service Unit Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex, Simplex Transmission Rate: Synchronous -2,400 bps, 4,800 bps, 9,600 bps Transmission Medium: Digital Termination Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$415 to \$540 Number Installed to Date: Under 100

TELEPROCESSING
PRODUCTS, INC.
TP-S51
Modem Cless: Channel Service Unit
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex, Simplex
Transmission Rate: Synchronous
14,400 pps, 56,000 bps
Transmission Medium: Digital
Termination

Date First Installed: November 1983

Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$625 to \$630 Number Installed to Date: Under 100 Date First Installed: December 1983

TELLABS, INC.
3010
Modern Class: Line Driver
Transmission Technique:
Asynchronous Mode: Full-Duplex
Transmission Mate: Asynchronous 600 bps. 1,200 bps. 2,400 bps.
4,800 bps. 9,600 bps
interface: RS-232C, RJ11
Transmission Medium: Voice-grade
Lines
Diagnostics: No
Distribution Method: End user
Price: \$100
Number Installed to Date: Under
100

(See Vendor Profile Page V-30)

TELLARS, INC.
310 DATAWOICE SYSTEM
Modem Class: Simultaneous Data/
Voice
Modem Class: Simultaneous Data/
Voice
Asynchronous
Transmission Technique:
Asynchronous110 bps, 300 bps, 1200
bps, 1,800 bps, 1,200
bps, 1,800 bps, 2,400 bps, 1,800
bps, 1,800 bps, 2,400 bps, 1,800
bps, 1,800 bps
Interface: RS-232C, RJ11
Transmission Medium: Voice-grade
Liniss

Date First Installed: March 1983

Features: Simultaneous Data/Voice Distribution Method: End user, Third-party Price: \$450 - \$500 Number Installed: to Date: Under 500 Date First Installed: 1982

TELMAC, INC.

LDD-1
Modern Class: Line Driver
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
Go0 bps, 1,200 bps, 1,800 bps,
2,400 bps, 4,800 bps, 9,800 bps,
1,400 bps, 1,800 bps, 9,800 bps,
1,400 bps
Interface: RS-232C
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Bull-In
Features: Diagnostics
Distribution Method: End user
Price: \$150
Number installed to Date: Linder

Date First Installed: June 1981 (See Vendor Profile Page V-30) TELMAC, INC.

SLD-1 Modern Class: Line Driver Transmission Technique: Synchronous Transmission Mode: Full-Duptex Transmission Rate: Synchronous -1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-In Features: Diagnostics Distribution Method: End user Price: \$450 Number Installed: 1983

TELEPORT 300 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 103 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Diagnostics, Clock Calendar, Switchable Data Rates, Touch-Tone to Ascii Distribution Method: OEM Date First Installed: December 1983 (See Vendor Profile Page V-30)

202 C/D
Modern Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Asynchronous
1,800 bps
Interface: RS-232C
Bell-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Bull-In
Distribution Method: End user
Price: \$325
(See Windor Profile Page V-31)

TIMEPLEX, INC.

TIMEPLEX, INC.
AIM SERIES
Modern Clease; Long-Haul
Transmission Technique:
Synchronous
Transmission Moder: Full-Duplex
Transmission Moder: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Modelm: Voice-Grade
Lines
Diagnostics; Fellback, Switchable
Data Rates
Diatribution Method: End user
Price: \$1.060 to \$2,825

TIMEPLEX, INC. R103 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C, MIL 188C Transmission Medium: Volco-Grade Lines Diagnoetics: Yes; Built-In Features: Autodial, Autoanswer, Diagnoetics

Distribution Method: End user

Price: \$315

TIMEPLEX, INC.
R103 C/D
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Asynchronous
300 bpe
Interface: RS-232C, MIL 188C
Belf-Compatible: 103, 113, 108
Transmission Medium: Voice-Grade
Diagnostics: Yes; Built-in
Features: Diagnostics
Distribution Method: End user
Price: \$255 to \$335

TIMEPLEX, 194C.
R202 C/D
Modem Clase: Long-Haul
Transmission Technique:
Asynchronous
Transmission Reite: Asynchronous
1,200 bps
Interface: RS-232C, Mill. 188C
Bell-Competible: 202
Transmission Medium: Voics-Grade
Lines
Diagnostics: Yes; Built-In
Features: Reverse Channel,
Diagnostics:
Distribution Method: End user
Price: \$380

THAEPLEX, INC.
V.29 PLUS
Modem Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Mate: Synchronous 9,600 bps
Interface: RS-232C, CCITT V.29
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Add-on
Feetbares: Autoequalizer,
Diagnostics, Multiport, Fallback,
Switchable Data Rates
Distribution Method: End user
Price: \$4,100 to \$4,600
Dete First Installed: January 1982

THMEPLEX, INC.
SLDM
Modem Class: Short-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rate: Synchronous
14,400 pps
Interface: RS-232C

Bell-Compatible: 43401 Transmission Medium: Voice-Grade Lines Diagnostica: Yee; Built-in Features: Diagnostics, Switchable Data Rates Distribution Method: End user Price: \$850

THW CORP. OPERATOR 103 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transm ission Rate: Asynchronous -300 bos Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Reverse Channel Distribution Method: End user. OEM, Third-party Price: \$189 Date First Installed: June 1983 (See Vendor Profile Page V-31)

TNW CORP. TNW-103 Modem Class: Long-Haul Transmission Technique: Asynchronous namisaion Mode: Half-Duplex. Tra Full-Duplex sion Rate: Asynchronous -300 bps Interface: IEEE-488 Bell-Compatible: 103 Diagnostics: No Features: Autodial, Autoanswer, Reverse Channel Distribution Method: End user, OEM, Third-party Price: \$449 Date First installed: January 1978

TRANSEND CORP.

MODEM CARD AMC-900

Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Roder: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Peatures: Autodial, Autonoswer,
Alternate Voice/Data, Diagnostics
Distribution Method: Third-party
Price: \$325
Number Installed: January 1983
Csee Vendor Profile Page V-311)

TRAMSEND CORP.
PC MODEM CARD 300
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
300 bps
Bell-Compatible: 103

Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoclial, Autoenswer, Atternate Voice/Data, Diagnostics Distribution Method: Third-party Price: \$349 Number Installed to Date: 100 - 500

TRANSEND CORP.
PC MODEM CARD 1200
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostica: Yes; Buill-In
Peatures: Autocial, Autoanswer,
Alternate Voice/Data, Diagnostics,
Switchable Data Rates
Distribution Method: Third-party
Price: \$549
Number Installed: October 1983

TRANSEND CORP. TRANS MODEM 1200 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoansv Alternate Voice/Data, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$695 Number Installed to Date: 100 - 500 Date First Installed: February 1983 TRI-DATA

Modem Class: Long Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex, Transmission Rate: Asynchronous-300 bps, 1,200 bps Interface: RS-232C Belf-Compatible: 212 Transmission Medium: Voice-Grade Lines Features: Autodial, Autoanswer Price: \$1,375 Date First Installed: September 1982 (See Vendor Profile Page V-31)

OZ 225

TRI-DATA
OZ GUARDIAN
Modern Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps, 1,200 bps
Interface: R8-230.

Transmission Medium: Voice-Grade Lines Diagnostica: Yes; Bullt-in Feetures: Autodial, Autoqualizer, Autoanswer, Diagnostica, Fallback, Switchable Data Rates, Security Coding Distribution Method: Third-party Price: \$750 Number Installed: September Date First Installed: September

TRY DATA PRODUCTS

202

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -1,200 bos Interface: RS-232C Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics ution Method: End user, OEM Price: \$175 to \$200 Number installed to Date: 100 - 500 (See Vendor Profile Page V-31)

TRT DATA PRODUCTS 212 Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212
Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoequalizer, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Switchable Data Rates Distribution Method: End user, OEM Price: \$250 Number Installed to Date: Under

Date First Installed: June 1983
Truck ELECTRONICS, INC.
MODEC 1540
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Asynchronous
300 bps
Interface: RS-232C
Belf-Competible: 103
Transmission Medium: Voice-Grade
Lines
Distribution Method: End user
Price: \$242
Date First Installed: August 1974
See Vendor Profile Page V-32)

100

TUCK ELECTRONICS, INC. MODEL 1653 Modern Class: Long-Hauf Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rise: Asynchronous 1,200 bps
Interface: RS-232C
Belf-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Diagnostice: Yes; Bult-In
Feetherse: Diagnostics
Distribution Method: End user
Price: \$275
Date First Installed: March 1981

TYMSBARR, BNC.
MODEL 912 MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
Synchronous - 300 bps, 1,200 bps
Interface: RS-232C
Bell-Compatible: 212
Transmission Medium: Volce-Grade
Lines
Feetures: Autoenswer, Diagnostics
Price: \$695
bate First Installed: 1980
(See Vendor Profile Page V-32)

UNGERNAMN-BASS, INC.
CATV-MODEM
Modem Class: Radio Frequency
Transmission Technique:
Synchronous
Transmission Made: Full-Duplex
Transmission Rate: Synchronous
14,400 bps
Interface: 1510 D-Type Connect
Transmission Medium: Wide-Band
Leria
Diagnostica: No
Distribution Nethod: End user
Price: \$750 to \$950
Number installed to Date: Under
100
Date Pirst Installed: April 1982
(See Vendor Profile Page V-32)

UNGERMANN-BASS, INC. NETWORK MODEM 640 Modern Class: Radio Frequency Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex, Simplex Transmission Rate: Asynchronous/ Synchronous - 19,200 bps Interface: RS-232C, CCITT V.35 Transmission Medium: Wide-Rand Lines Diagnostics: No Feetures: Diagnostics, Switchable **Data Rates** Distribution Method: End user Price: \$895 or installed to Date: 5,000 -10,000 **Date First Installed: February 1980** 

UNGERMANN-BASS, INC. NETWORK MODEM 670 Modem Class: Radio Frequency (RF) Transmission Technique: Asynchronous. Synchronous Transmission Mode: Full-Duplex, Simplex Transmission Rate: Asynchronous/Synchronous - 14,400 bps Interface: RS-232C Transmission Medium: Wide-Band Lines Diagnostica: No Festures: Diagnostics; Switchable Data Rates Distribution Method: End user Price: \$1,990 Mumber installed: June 1978 Date First Installed: June 1978

UNIVERSAL DATA SYSTEMS, INCC.

103 LP O/A
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mode: System
Transmission Mode: Full-Duplex
Transmission Medium: Viole-Grade
Lines
Features: Alternate Viole-Grade
Lines
Features: Alternate Viole-Unita,
Teloc Line Powered
Distribution Method: Third-party
Price: \$145
Date First Installed: 1978
(See Vendor Profile Page V-32)

UNIVERSAL DATA SYSTEMS, INCC.
103J
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Asynchronous
Transmission Rate: Asynchronous-110 bps, 300 bps
Interface: RS-232C, CCTT V.24
Bell-Compatible: 103, 113
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes: Built-in
Features: Autonaswer, Alternate
Voice/Data, Diagnostics
Distribution Method: Third-party
Price: \$425
Dete First Installed: 1982

UNIVERBAL DATA SYSTEMS, 194C.
194C.
193.H.P. Modern Class: Long-Haul Transmission Technique: Asynchronous - Asynchronous - 110 bps, 300 bps interface: RS-232C, CCTT V.24 Bell-Compatible: 103, 113 Transmission Medium: Voice-Grade Lines Feetures: Autoanswer, Alternate Voice/Guta, Telo Line Powered Distribution Method: Third-party Privar X192

UNIVERSAL DATA SYSTEMS, INC. 108 Modern Class: Long-Haul

Date First Installed: 1978

Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
-110 bps, 300 bps
Instrace: RS-232C, CCITT V.24
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Built-in
Features: Alternate Voice/Data,
Diagnostics, Mutichop
Distribution Method: Third-party
Price: \$293
Date First Installed: 1983

UNIVERSAL DATA SYSTEMS, INC.
2018
Modern Cless: Long-Haul Transmission Technique: Synchronous Transmission Rede: Full-Duplex Transmission Rede: Synchronous - 2,400 bps Interface: RS-232C, CCITT V.24
Bell-Compatible: 201
Transmission Medium: Voice-Grade Lines
Diagnostics: Yes; Built-in Features: Diagnostics; Antistreaming Diagnostics; Antistreaming Diagnostics (See 1) Diagnostics (See

Price: \$965

Date First installed: 1981

UNIVERSAL DATA SYSTEMS. 201C Modern Class: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex saion Rate: Synchronous -2,400 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 201 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics, Test Pattern Generator Distribution Method: Third-party Price: \$775 Date First Installed: September

UNIVERSAL DATA SYSTEMS, INC.
2021P
Modern Class: Long-Hauf
Transmission Technique:
Asynchronous
Transmission Ride: Half-Duplex
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous
Interface: RS-232C, CCITT V.24
Belf-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Features: Alternate Voice(Data,
Telco Line Powered
Distribution Method: Third-party
Price: \$195
Date First Installed: September
1981

UNITYERBAL DATA SYSTEMS, 18MC, 2028
Modern Cless: Long-Haul Transmission Technique: Asynchronous Transmission Mede: Half-Duplex, Full-Duplex, Full-Duplex, Transmission Rete: Asynchronous-110 bps, 300 bps, 600 bps, 1,200 bps, 100 bps, 200 bps, 200 bps, 1,200 bps, 200 bps, 2

UNIVERSAL DATA SYSTEMS, 2028/88 Modern Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Half-Duplex, Full-Dunley Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps Interface: RS-232C, CCITT V.24 Bell-Compatible: 202 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autoanswer, Alternate Voice/Data, Diagnostics, Test Pattern Generator Distribution Price: \$550 Date First Installed: 1981

UNIVERSAL DATA SYSTEMS, INC.
2025LP
Modern Cless: Long-Haul
Transmission Technique:
Asynchronous.
Transmission Moder: Half-Duplex
Transmission Rate: Asynchronous
-110 byte, 300 bps, 600 bps
Interfese; FS-232C, CCTTT V.24
Bell-Compatible: 202
Transmission Medium: Voice-Grade
Linde Inc.
Linde Linde Linde Linde Linde
Festivation Medium: Voice-Grade
Linde Linde Linde
Voice/Data
Distribution Method: Third-party
Price: \$245
Date First Installed: 1982

Date First Installed: 1962
UNIVERSAL DATA SYSTEMS, INC.
202T
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Fulf-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps, 1,200
Interface: RS-232C, CCITT V.24
Belf-Compatible: 202
Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Alternate Voice/Data, Diagnostics, Antistreaming Distribution Method: Third-party Price: \$425 Date First Installed: 1982

UNIVERSAL DATA SYSTEMS, 184C. 208A/B Modem Class: Long-Haul Transmission Technique:

Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rete: Synchronous -4,800 bps Interface: RS-232C, CCITT V.24 Belf-Compatible: 208 Transmission Medium: Voice-Grade

Lines
Diagnostica: Yes; Built-in
Features: Autoanswer, Alternate
Voice/Date, Diagnostics,
Antistreaming
Distribution Method: Third-party

Price: \$1,750 Date First Installed: 1981

212A
Modem Cleas: Long-Haul
Trenamission Technique:
Asynchronous, Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps, 600 bps;
Asynchronous/Synchronous - 1,200

UNIVERSAL DATA SYSTEMS.

bps Interface: RS-232C, CCITT V.24 Bell-Competible: 103, 113, 212 Transmission Medium: Voice-Grade Lines

Diagnostics: Yes; Built-in
Festures: Autoanswer, Alternate
Voice/Data, Diagnostics, Switchable
Data Rates
Distribution Mathod: Third-party

Price: \$595 Date First Installed: 1982

UNIVERSAL DATA SYSTEMS, INC. 212A/D

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rete: Asynchronous -110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps

Interface: RS-232C, CCITT V.24 Bell-Compatible: 103, 113, 212 Transmission Medium: Voice-Grade Lines

Diagnostica: Yes; Built-in Features: Autodial, Autoanswer, Atternate Voice/Data, Switchable Data Rates, Phone Number Memory Distribution Method: Third-party Price: \$645

Date First Installed: 1983

UNIVERSAL DATA SYSTEMS, INC. 212LP Modern Class: Long-Haul Transmission Technique:
Asynchronous
Asynchronous
Transmission Mode: Full-Dupkex
Transmission Rate: Asynchronous
1,200 bps
Interface: RS-232C, CCITT V.24
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: No

Diagnostics: No Features: Alternate Voice/Data, Telco Line Powered Distribution Method: Third-party Price: \$445 Date First Installed: 1982

UNIVERSAL DATA SYSTEMS, INC. 9600

9600
Modern Clees: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Full-Duplex
Transmission Rate: Synchronous 4,800 bps; 9,600 bps;
Asynchronous/Synchronous - 7,200
bps

interface: RS-232C, CCITT V.24 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in

Diagnostics: Yes; Built-in Features: Autoequalizer, Diagnostics, 100 msec Train Time Distribution Method: Third-party Price: \$2,650 Date First Installed: 1983

UNIVERSAL DATA SYSTEMS, INC. 9500A/B

Modern Cleas: Long-Haul Transmission Technique: Synchronous Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Synchronous -4,800 bps, 9,600 bps; Asynchronous/Synchronous - 7,200 bps

bps Interface: RS-232C, CCTT V.24 Transmission Medium: Voice-Grade

Lines
Diagnostics: Yes; Built-in
Features: Autoequalizer,
Autoarswer, Alternate Voice/Data,
Diagnostos; Falback; Switchable
Data Rates, Antistreaming
Distribution Method: Third-party
Price: \$2,650
Date First installed: 1983

U. S. ROBOTICS, INC.
IBM PC MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
300 bps. 1,200 bps
Interface: Plug-in Board to IBM PC
Bell-Compa

Feetures: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics Distribution Method: End user, OEM Price: \$449 (See Vendor Profile Page V-32) U. S. ROBOTICS, INC.

IBM PC 64
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps, 1,200 bps
interface: Plug-in Board to IBM PC
Bell-Compatible: 212
Transmission Medium: Voice-Grade

Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data, Diagnostics, Clock Calendur, Fallback, Parallel Port Distribution Method: End user, OEM Price: \$599

U. S. ROBOTICS, INC.
IBM PC MODEM 256
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Rate: Asynchronous
300 bps. 1,200 bps
Interface: RS-232C, Plug-In Board
to IBM PC.

Bell-Compatible: 212
Transmission Medium: Voice-Grade Lines
Diagnostics: No
Features: Autodial, Autoequalizer, Autoanswer, Alternate Voice/Data,

Diagnostics, Clock Calendar, Fallback, Switchable Data Rates, Parallel Port Distribution Method: End user, OEM Prices \$1.149

U. S. ROBOTICS, INC. OEM 4

Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps. 1,200 bps. Interface: PPL Bell-Compatible: 212 Transmission Medium: Voice-Grade

Lines
Diagnostics: No
Features: Autodial, Autoequalizer,
Autoanswer, Alternate Voice/Data,
Fallback
Distribution Method: OEM
Price: \$300

U. S. ROBOTICS, INC. PASSWORD Modem Class: Long-Haul Transmission Technique:

Asynchronous
Transmission Mode: Fuli-Duplex
Transmission Rate: Asynchronous 300 bps, 1,200 bps
Interface: R5-232C
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostics: No
Features: Autociai, Autoequalizer,
Autoanswer, Alternate Voice/Data,
Diagnostics, Faliback, Switchable
Data Rates
Diagnostics, Faliback, Eviduable
Data Rates
Diagnostics, Diagno

Price: \$448 Number Installed to Date: 5,000 -10,000 Date First Installed: May 1983

U. S. POBOTICS, INC.
S100 BUS MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Ratie: Asynchronous 300 bps. 1,200 bps
Interface: RS-232C
Bell-Compatible: 212
Transmission Béedium: Voice-Grade
Lines
Diegnostics: No
Features: Autoclail, Autosqualizer,

Autoanswer, Alternate Voice/Data, Fallback, Switchable Data Rates Distribution Method: End user, OEM Price: \$449 VEN-TEL, INC.

ALD SERIES Modern Class: Line Driver ion Technique: Asynchronous Trensmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps. 9,600 bps Interface: RS-232C Transmission Madium: Voice-Grade 1 ines Diagnostics: Yes; Built-in Features: Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$205 to \$320

Prices 2005 of 2015
Date Pirat installed: June 1977
(See Vendor Profile Page V-32)
VEM-TEL, IRIC.
SLD-SERIES
Modem Cleas: Line Driver
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex

Transmission Rate: Synchronous-110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps firefrace: R5-232C Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Peatures: Diagnostics, Switchable Data Rates

Data Rates
Distribution Method: Third-party
Price: \$380 to \$450
Date First Installed: January 1978

VEN-TEL, 199C.
212 SERIES
Modern Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous
Synchronous - 300 pps, 1,200 bps
Interface: RS-232C
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines

Diagnostics: Yes; Bult-in Features: Autoclai, Autonawer, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$425 to \$675 Number Installed: 1979

VEH-TEL, IMC,
1200 - PLUS
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Refe: Asynchronous
- 300 bps, 1,200 bps
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diegnostics: Yes; Built-In
Feetures: Autodial, Autoanswer,
Diegnostics; Switchable Data Rates
Destribution Method: Third-party
Price: \$499
Date First Installed: December 1983

VEBS-TELL, 189C.
Mid 103-1/2E
Modern Clases: Long-Haul
Transmission Technique:
Asynchronorus
Transmission Revie: Asynchronous
-110 bps, 300 bps
Interface: 182-232C
Bell-Competible: 103
Transmission Medium: Violo-Grade
Lines
Diagnostics: Yes; Built-In
Features: Diagnostics, Switchable
Data Rates
Distribution Method: Third-party
Price: 2245 to \$315

Date First Installed: 1982

VEIN-TELL, 199C.

MD 103J SERIES
Modem Class: Long-Haul
Transemission Technique:
Asynchronous
Transemission Ratie: Asynchronous
-110 bps, 300 bps
Interface: RS-252C
Bell-Competitive: 103
Transemission Medicams: Voice-Grade
Lines
Diagnoselica: Yes; Bullt-In
Features: Autorial, Autonswer,
Diagnostics, Switchable Deta Raties
Detribution Method: Thir-party
Price: \$245 to \$415

VEN-TEL, INC.
MD 113 SERIES
Modern Cleas: Long-Hauf
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
110 bps, 300 bps
Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines.

Diagnostics: Yes; Bullt-in Features: Autoenswer, Diagnostics, Switchable Data Rates Distribution Method: Third-party Price: \$245 to \$315 Date First Installed: 1982

VEN-TEL, INC.

MD 201-1

Modern Clear: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Half-Duplex
Transmission Rate: Synchronous 2,400 bps
Interface: RS-232C
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Bult-In
Features: Autoenswer, Diagnostics
Distribution Meditod: Third-party
Price: \$730 to \$800

Date First Installact: January 1979

VEN-TEL, INC.
MD 201-3/4E
Modern Class: Long-Haul
Transmission Technique:
Synchronous
Transmission Mode: Hall-Duplex,
Full-Duplex
Transmission Rate: Synchronous 2,400 bps
Interface: RS-232C
Bell-Compatible: 201
Transmission Medium: Voice-Grade
Lines
Diagnostics: Yes; Bull-In
Fastures: Diagnostics
Distribution Method: Third-party
Price: \$605 to \$575
Date First Interlated: Linguary 1979

MD 202-1/2E

Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex
Transmission Rate: Asynchronous
Transmission Rate: Asynchronous
Transmission Bob ps. 600 bps, 1,200
bps
Interface: RS-232C
Bell-Compatible: 202
Transmission Medium: Voice-Grade
Lines
Disgnostics: Yes; Built-in
Feetures: Autoanswer, Disgnostics,
Switchalzb Data Rates
Distribution Medium: Voice-Grade
Price: \$310 to \$380

VERN-TEL, INIC.
MD 202-5/6E
MD 202-5/6E
MD 202-5/6E
Modem Cleas: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Half-Duplex,
Full-Duplex,
Transmission Rete: Asynchronous
-10 bps, 300 bps, 600 bps, 1,200
bps, 1,800 bps
Inleafrace: RS-232C
Bell-Compatible: 202
Transmission Medium: Vioce-Grade
Lines
Diagnostics: Yes; Built-In
Features: Diagnostics, Switchable

Data Rates
Distribution Method: Third-party
Price: \$280 to \$350
Date First Installed: January 1979

VEH-TEL, INC.
PCIA-H150P
Modern Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Mode: Full-Duplex
Transmission Mede:
100 bps. 1,200 bps.
Interface: HP150
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostica: Yos; Buill-In
Features: Autoclai, Autoanswer,
Diagnostica: Switchable Data Rates
Distribution Method: Third-party
Price: \$425
Date First Installed: December 1983

PCBI-XT
Modem Class: Long-Haul
Transmission Technique:
Asynchronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous 300 bps, 1:200 bps
interface: IBM PC
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Lines
Diagnostics; Switchable Data Rates
Disgnostics; Switchable Data Rates
Distribution Method: Thirt-party
Price: \$549
Date First Installed: December 1983

VEM-TEL, INC.
PCM-1202
Modem Class: Long-Haul
Transmission Technique:
Asynchronor Mode: Full-Duplex
Transmission Rate: Asynchronous 300 lpps, 1,200 lpps
interface: IBM PC
Bell-Compatible: 212
Transmission Medium: Voice-Grade
Linos
Diagnostics: Yes; Built-in
Features: Autodial, Autoanswer,
Diagnostics; Switchable Data Rates
Distribution Method: Third-party
Price: \$499
Date First Installed: December 1983

VERISTROM, INC.
FOM-7
Modern Class: Fiber-Optic
Transmission Technique:
Asynchronous, Synchronous,
Isochronous
Transmission Mode: Full-Duplex
Transmission Rate: Asynchronous
Synchronous -2,400 bps, 4,800 bps,
9,800 bps, 14,400 bps; Synchronous
-38,4K bps
Interface: RS-232C, MIL 188C
Transmission Medium: Fiber Optics
Price: \$750
Date First Installed: 1982
(See Vendor Profile Page V-32)

VISIONARY ELECTRONICS, VISIONARY 100 Modern Class: Long-Haul Transmission Technique: Asynchronous ion Mode: Half-Duplex. Full-Duplex saion Rate: Asynchronous -300 bps Interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer. Reverse Channel, Multiport, Clock Distribution Method: End user, OEM, Third-party Price: \$595 Number Installed to Date: Under 100 Date First Installed: November 1982 (See Vendor Profile Page V-32)

VISIONARY ELECTRONICS. INC. VISIONARY 1200 Modern Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Half-Duplex. Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade Lines Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Reverse Channel, Diagnostics, Multiport Clock Calendar Switchable Data Rates Distribution Method: End user. OEM. Third-party Price: \$795 Date First Installed: November 1983

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Interface: RS-232C Transmission Medium: Voice-Grade Lines Diagnostics: No Distribution Method: End user Number Installed: Date: Under 100 Date First Installed: April 1983 (See Vendor Profile Page V-32)

WANG LABORATORIES, INC.

CATY MODEM

WANG LASORATORIES, INC.
WA 3451 MODEM
Modem Class: Long-Haul
Transmission Technique:
Asynchronous, Synchronous
Transmission Mode: Half-Duplex,
Full-Duplex
Transmission Rates: Asynchronous
-110 bps, 300 bps; Asynchronous/
Synchronous - 1,200 bps

1982

risce: RS-232C, CCITT V.24 Bell-Competible: 103, 212 Transmission Medium: Vol lum: Voice-Grade Diagnostics: No Features: Autodial, Autoenswer, Diagnostics, Switchable Data Rates Distribution Method: End user

Price: \$1,050 Number Installed to Date: 100 - 500 Date First Installed: June 1981

WESTERN DATACOM 212 AUTODIAL

Modem Class: Long-Haul Transmission Technique: Asynchronous, Synchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous/ Synchronous - 1,200 bps: Asynchronous - Up to 300 bps Interface: RS-232U Bell-Compatible: 212 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer. Alternate Voice/Data, Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: End user, Third-party Price: \$625 Number installed to Date: 200 Date First installed: March 1984 (See Vendor Profile Page V-33)

WESTERN DATACOM WORLDCOM 200 Modern Class: Long-Haul Transmission Technique: Asynchronous

Transmission Mode: Half-Duplex, Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 103, 202 Transmission Medium: Voice-Grade Diagnostics: Yes; Built-in Features: Autodial, Autoanswer, Alternate Voice/Data, Reverse Channel, Diagnostics, Fallback, Switchable Data Rates Distribution Method: Third-party Price: \$595 Number installed to Date: 10 Date First Installed: September

WESTERN TELECOMPUTING

CORP. 103 MODEM #507 Modem Class: Line Driver Transmission Technique: Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps Interface: RS-232C
Bell-Compatible: 103
Transmission Medium: Voice-Grade
Lines, Narrow-Band Lines, Radio Links Diagnostics: Yes; Add-on Features: Autodial Distribution Method: End user

Price: \$390 Number Installed to Date: Under **Date First Installed: September** 

1982 (See Vendor Profile Page V-33) WESTERN TELECOMPUTING

103/12 MODEM #508 Modern Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps

300 bps Interface: RS-232C Bell-Correpatible: 103 Transmission Medium: Voice-Grade Lines, Narrow-Band Lines, Radio Diagnostics: Yes; Add-on Features: Autodial Distribution Method: End user Price: \$825

Number Installed to Date: Under

Date First Installed: January 1982

WESTERN TELECOMPUTING CORP. SATELLITÉ MODEM #508

Modem Class: Line Driver Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps interface: RS-232C Bell-Compatible: 103 Transmission Medium: Voice-Grade Lines, Narrow-Band Lines, Radio Links

Diagnostics: Yes; Add-on Features: Autodial Distribution Method: End user Price: \$275 Number Installed to Date: Under 100

Date First Installed: January 1982

WOLFDATA, INC. WD-212A

Modem Class: Long-Haul Transmission Technique: Asynchronous Transmission Mode: Full-Duplex Transmission Rate: Asynchronous -300 bps, 1,200 bps Interface: RS-232C Bell-Compatible: 212 Transmission Medium: Voice-Grade

Lines Diagnostics: Yes; Built-in Features: Autodial, Autoequalizer, Autoenswer, Diagnostics, Switchable Data Rates Distribution Method: OEM Number Installed to Date: 1,000 -

Date First Installed: March 1982 (See Vendor Profile Page V-33)

ZOOM TELEPHONICS, INC. NETWORKER Modern Class: Long-Hauf Transmission Technique: Asynchronous namission Mode: Half-Duplex,

Full-Duplex sion Rate: Asynchronous -Transm 110 bps, 300 bps Interface: Apple II Bell-Compatible: 103 Transmission Medium: Voice-Grade

Lines Diagnostics: No Features: Alternate Voice/Data Distribution Method: End user

Date First Installed: August 1983 (See Vendor Profile Page V-33)

# MULTIPLEXERS

## **Multiplexer Index by Class**

The index to multiplexers has been grouped according to device type — concentrators, frequency-division, fiber-optic, network concentrators, statistical, time-division and wideband. The last section of the index includes all multiplexers which do not fit into any of the above categories. Within each section, products have been arranged alphabetically by vendor and include price information and the page number on which the complete product listing may be found. The actual product listings have been grouped alphabetically by vendor.

#### Concentrators

VENDOR	MODEL	PRICE	PAG
Computer Systems	CS/88	\$1,500 to \$3,000	
	IDE-250BA, -250CA		
	RDS-1600		
	SBR-700		
Horthern Telecom	COMM-MULTIPLEXER	\$2,000	A-I
Philips Electronics Instruments	FLEXPAC PAD	N/A	A-1
	COMMUNICATIONS MULTIPLEXER (71-3000)		

## Fiber-Optic Multiplexers

VENDOR	MODEL	PRICE	PAGE
Belden Corp.	BIT-DRIVER 222-006		. A-69
Canoga Data Systems	CMX-320	\$2,500	. A-70
	CMX-808		
	CMX-816	\$2,750	. A-70
Fibronics International, Inc.	FM 814	\$2,000 to \$2,800	. A-79
,	FM 818		
	FM 832		
	FM 1608		
	FM 1632		
Manage, Inc.			

## Frequency-Division Multiplexers

VENDOR	MODEL	PRICE	PAGE
Black Box Catalog/Expandor, Inc.	SYNCHRONOUS CHANNEL SPLITTER (SCS-2) .	\$355	A-69
Coherent Communications Systems Corp	FSM-76	\$7,200 to \$11,400	A-72
	LINEMATE 192	\$500	A-72
	SPM-94A	\$475	A-72
Micom Systems, Inc.	INSTALINK460 MODEL M461	\$550 to \$575	A-85

## **Network Concentrators**

VENDOR	MODEL	PRICE	PAGE
Datagram Corp.	DM900	\$1,550 to \$2,750	A-74
	DM1600	\$2,200 to \$4,600	A-74
	DM4800	\$3.650 to \$13.250	A-74
General Datacomm Industries, Inc			
	GENNET 1262		A-81
Infotron Systems Corp	792 NETWORK CONCENTRATOR	\$4,500 to \$7,900	A-82
	SM480 WITH 790NC OR 792NC	\$1,200	A-82
	SM680 WITH 790NC OR 792NC	\$1,200	A-82
	SUPERMUX 790	\$4,600 to \$7,100	A-82
Megadata Corp.	SM5/X INTERFACE-A	\$1,500	A-85
	SM5/X INTERFACE-S	\$1,500	A-85
Racal-Vadic	SCOTSMAN III	N/A	A-92

VENDOR	MODEL	PRICE	PAGE
Rixon, Inc.	DCX840 NETWORK MUX		
Undata, Inc.	DCX850 SWITCHING MUX		

# Statistical Multiplexers

ENDOR	MODEL PRICE	PA	GE
lackus Deta Systems	SWITCHABLE/STATISTICAL MULTIPLEXER	A	-88
lack Box Catalog/Expander, Inc			-80
	DATA CONCENTRATOR 2HP \$1,050		
	DATA CONCENTRATOR 4 \$1,400		
	DATA CONCENTRATOR 4HP		-66
	DATA CONCENTRATOR 8 \$2,200		
	DATA CONCENTRATOR 8HP		-63
	GENERAL PURPOSE DATA CONCENTRATOR \$1,050 to \$2,200		
ermetek Microelectronics			
hung Telecommunications			
edex Corp			
	6001 INTELLIGENT NETWORK PROCESSOR \$1,500 to \$4,925	A	.71
	6005 INTELLIGENT NETWORK PROCESSOR \$2,600 to \$7,000	A	-71
	6010 INTELLIGENT NETWORK PROCESSOR	A	-7
	6030 INTELLIGENT NETWORK PROCESSOR	A	-71
	6040 INTELLIGENT NETWORK PROCESSOR	A	-71
	6050 DISTRIBUTED COMMUNICATIONS PROCESSOR \$45,000	A	-71
omDesign, Inc.	TC-500 \$1,700 to \$7,800		-72
ommunication Devices, Inc.		A	-73
omplex Systems, Inc.			
ompre Communications, Inc.			
	BILINK 2AS192		7
	DATA XCHANGE		7
	ECONO SERIES 4		
	ECONO SERIES 8		
	Q-LINK 4AA24		
	Q-LINK 4AS192 \$1,195		
omputer Identics Corp			
	TAMM-16A \$5,000	) A	-7
omputer Peripheral Systems, Inc	MARS SYSTEM MUX/CONCENTRATOR \$1,500 to \$5,000	) A	-74
omputrol	MEGA PLEX \$5,000 to \$10,180	A	-7
stagram Corp	DM 900	) A	-7
	DM 1600 \$2,200 to \$4,600		
	DM 4800		
etaproducts New England, Inc			
	MC 3 \$6 715 to \$10 800	) 4	-7
statel, Inc.	DCP 5000 \$1,300		7
stee. Inc.	DATEC DATAMUX \$830		-
CA/TAC	AYARWM 205 \$4,250 to \$6,000		7
***************************************	SYSTEM 105. \$1,295 to \$2,650		
	SYSTEM 110. \$1,295 to \$2,650		
	SYSTEM 120\$2,450 to \$8,590		
	SYSTEM 125\$3,250 to \$9,395		
	SYSTEM 325 NETSWITCH	A	-7
	SYSTEM 335\$6,795 to \$7,195		
	SYSTEM 355 \$9,995 to \$11,295		
eveloen Electronics, Inc			
	DS1800	) A	-7
	DS4800	) A	-7
igital Equipment Corp	DFM04	5 A	-7
	DFM08	2	-7
	DFM12 \$4,073	5 A	-7
	DFM16	9 4	1-7
ynatech Packet Technology, Inc.			
,	MULTIPAD 25		
	MULTIPLEX 25 \$1,500 to \$50,000		-/
modey Com	CS01-H		-/
	0044 F		-1
	CS11-F N/		-7
	CS11-H N/		
	CS11-U N/	A A	1-7
	CS11-V N//	4 A	1-7
	CS21-F N/A	4 A	1-7
	CS21-H	4 A	1-7
	CS21-U	4	1-7
	CS21-Z N/		
	CSM11-MH		
	CSM11-MU		

	MODEL PRICE	PAG
mulex Corp	CSM21-MU	
• • • • • • • • • • • • • • • • • • • •	CSM21-MZ N/A	
	CSM21-NH	
ricson Progmatic. Inc.	1111	A-1
	1112 \$1,140	A-
	1114 \$1,510	A-
	1118	4.
riedman Associates	DATAGRAM DM900 \$1,550 to \$2,750	A.
mountain medociates	DATACRAM DM1800 62 000 to \$5,000	4.
	DATAGRAM DM1600 \$2,900 to \$5,000 DATAGRAM DM4800 \$3,600 to \$13,200	A.
	NEC STAT MUX	
	F 1951A	
tigitali America, inc	PIN 9101 E	
ismitian Data, Inc	PIN 9101 E\$2,000 to \$5,700	
	PIN 9103 \$1,650 to \$7,150	
	PIN 9106	A-
ITE Network Systems, Inc.	9004 A/B	
laicyon Communications	4001\$1,700 to \$4,100	
	4220 \$3,800 to \$6,500	
nfotron Systems Corp	SUPERMUX 380 STAT MUX	A-i
	SUPERMUX 480 STAT MUX \$1,900 to \$6,000	A:
	SUPERMUX 616	
	SUPERMUX 632 \$9,000	
	SUPERMUX 680 STAT MUX	A-
	SUPERMUX 780 STAT MUX	A.
sterective Systems/3M	SUPERMUX 780 STAT MUX \$1,700 MODEL 6330 STAT MUX \$3,640 to \$8,150	A-
sterbusiness Corp.	DUAL MUX A	A.
	DUAL MUX S	A.
	QUAD MUX S\$1,150	A
	QUAD MUX (4 CHANNEL STAT MUX)\$1,150	
nterien, Inc.	QUAD MUX (4 CHANNEL STAT MUX)	
nter-Link	. LN-1000	
	LN-2000 \$1,895 to \$2,695	A
	LN-4000 \$2,995 to \$3,995	A-
licom Systems, Inc	. MICRO 200 PORT CONCENTRATOR	A-
	MICRO 500 ERROR CONTROLLER \$795	A-
	MICRO 800/2 DATA CONCENTRATOR \$1,050 to \$4,600	) A-
	MICRO 800/X25	) A-
	MICRO 900/2 MULTIDROP CONCENTRATOR \$900 to \$4,600	) A-
	MICRO 5000 INTELLIGENT MODEM \$1,500 to \$3,400	)
,	MICRO 8000 CONCENTRATOR MODEM	A.
fulti - Tech Systems, Inc	MULTI-MUX	
letwork Products, Inc.		A.
	BABY NET \$1,450 to \$2,400 DCX-815 \$1,690 to \$2,180	) A-
	BABY NET \$1,450 to \$2,400 DCX-815 \$1,690 to \$2,180 DCX-825 \$3,200 to \$7,200	)
	BABY NET \$1,450 to \$2,400 DCX-815 \$1,690 to \$2,780 DCX-825 \$3,200 to \$7,200 DCX-840 \$10,000 to \$85,000	A
	BABY NET \$1.450 to \$2.400 DCX-815 \$1.690 to \$2.160 DCX-825 \$3.200 to \$7.200 DCX-840 \$10.000 to \$85.000 DCX-850 \$15.000 to \$10.000	A A
	BABY NET \$1.450 to \$2.400	2
	BABY NET \$1.450 to \$2.400 to \$2.400 to \$2.400 to \$2.400 to \$2.400 to \$2.100 to \$2.100 to \$2.100 to \$2.100 to \$2.200 to \$7.200	2
aradyne Corp.	BABY NET \$1.450 to \$2.400 DCX-815 \$1.690 to \$2.400 DCX-825 \$3.200 to \$7.200 DCX-840 \$10.000 to \$8.000 DCX-850 \$15.000 to \$100.000 DCX-861 \$2.200 to \$7.00,000 DCX-871 \$4.500 to \$8.600 DCX-871 \$4.500 to \$8.600	A-1
aradyne Corp	BABY NET         \$1.450 to \$2.400           DCX-815         \$1.690 to \$2.400           DCX-825         \$3.200 to \$7.200           DCX-840         \$10.000 to \$85.000           DCX-850         \$15.000 to \$700.000           DCX-851         \$2.200 to \$3.000           DCX-871         \$4.500 to \$8.000           MP-14.4 SM         \$14.970           BABY NNET         \$1.450 to \$2.400	A-10 A-10 A-10 A-10 A-10 A-10 A-10 A-10
aradyne Corp	BABY NET \$1.450 to \$2.400 DCX-815 \$1,690 to \$2.400 DCX-825 \$3,200 to \$7.200 DCX-840 \$10,000 to \$8.000 DCX-840 \$10,000 to \$8.000 DCX-850 \$15,000 to \$100,000 DCX-861 \$2,200 to \$7.00,000 DCX-871 \$4,500 to \$8.000 DCX-871 \$1,450 to \$2.400 DCX-871 \$1,4	7
aradyne Corp	BABY NET \$1.450 to \$2.400	7 A-1
aradyne Corp	BABY NET \$1.450 to \$2.40 to DCX-815 \$1.690 to \$2.40 to DCX-815 \$1.690 to \$2.40 to DCX-825 \$3.200 to \$7.200 to DCX-840 \$10.000 to \$8.60 to DCX-840 \$10.000 to \$8.60 to DCX-850 \$15.000 to \$100.00 to \$100.00 to DCX-851 \$2.200 to \$100.00 to DCX-851 \$2.200 to \$1.000 to DCX-851 \$2.200 to \$3.00 to DCX-871 \$4.500 to \$8.00 to \$9.00 to	A A A A A A A A A A A A A A A A A A A
aradyne Corp	BABY NET         \$1.450 to \$2.40t           DCX-815         \$1.690 to \$2.40t           DCX-825         \$3.200 to \$7.20t           DCX-840         \$10.000 to \$8.00t           DCX-850         \$15.000 to \$100,00t           DCX-851         \$2.900 to \$3.30t           DCX-871         \$4.500 to \$3.30t           MP-14.4 SM         \$1.450 to \$8.80t           SNP 1101         \$690           SNP 1102         \$890           SNP 1104         \$1.290           SNP 1108         \$1.495 to \$2.20t           SNP 1208         \$1.495 to \$2.20t	7 A-17 A-17 A-17 A-17 A-17 A-17 A-17 A-1
aradyne Corp	BABY NET         \$1.450 to \$2.40t           DCX-815         \$1.690 to \$2.40t           DCX-825         \$3.200 to \$7.20t           DCX-840         \$10.000 to \$8.00t           DCX-850         \$15.000 to \$100,00t           DCX-851         \$2.900 to \$3.30t           DCX-871         \$4.500 to \$3.30t           MP-14.4 SM         \$1.450 to \$8.80t           SNP 1101         \$690           SNP 1102         \$890           SNP 1104         \$1.290           SNP 1108         \$1.495 to \$2.20t           SNP 1208         \$1.495 to \$2.20t	7 A-17 A-17 A-17 A-17 A-17 A-17 A-17 A-1
Phoenix Bigital Corp	BABY NET \$1.450 to \$2.400	7 A-
tradyne Corp	BABY NET \$1.450 to \$2.400	7 A A A A A A A A A A A A A A A A A A A
nadyne Corp	BABY NET \$1.450 to \$2.400 DCX-815 \$1.690 to \$2.400 DCX-815 \$1.690 to \$2.400 DCX-825 \$3.200 to \$7.200 DCX-840 \$10.000 to \$8.600 DCX-840 \$10.000 to \$8.600 DCX-850 \$15.000 to \$100.000 DCX-851 \$2.200 to \$7.000 DCX-851 \$2.200 to \$7.000 DCX-851 \$2.200 to \$7.000 DCX-851 \$4.500 to \$4.000 DCX-851 \$4.500 to \$4.000 DCX-851 \$4.500 to \$4.000 DCX-851 \$4.500 to \$4.000 DCX-851 \$1.450 to \$2.400 DCX-851 \$1.000 DCX-851 \$1.450 to \$2.400 DCX-851 \$1.000 DCX-8	7 A A A A A A A A A A A A A A A A A A A
tradyne Corp	BABY NET \$1.450 to \$2.400	7 A A A A A A A A A A A A A A A A A A A
tradyne Corp	BABY NET \$1.450 to \$2.400	7
Phoenix Digital Corp	BABY NET \$1.450 to \$2.400	7
hoonix Digital Corp	BABY NET \$1.450 to \$2.400	7
hoonix Digital Corp	BABY NET \$1.450 to \$2.400 to \$2.400 to \$2.400 to \$2.400 to \$2.400 to \$2.600	7
hoonix Digital Corp	BABY NET \$1,450 to \$2,400 to \$2,100 to \$2,200 to \$7,200	7
hoonix Digital Corp	BABY NET \$1.450 to \$2.400 to \$2.400 to \$2.400 to \$2.400 to \$2.600	7
hoonix Digital Corp	BABY NET \$1.450 to \$2.40 to DCX-815 \$1.690 to \$2.40 to DCX-815 \$1.690 to \$2.40 to DCX-825 \$3.200 to \$7.200 to DCX-840 \$10.000 to \$8.60 to DCX-840 \$10.000 to \$8.60 to DCX-861 \$2.200 to \$7.00 to DCX-871 \$4.500 to \$8.60 to DCX-871 \$1.450 to \$2.40 to DCX-871 \$1.450 to DCX-871	7 A A A A A A A A A A A A A A A A A A A
hoenix Digital Corp	BABY NET \$1.450 to \$2.400	7
hoenix Digital Corp	BABY NET \$1,450 to \$2,400 to \$2,160	2
hoenix Digital Corp	BABY NET \$1.450 to \$2.400. DCX-815 \$1.690 to \$2.100. DCX-825 \$3.200 to \$7.200. DCX-840 \$10.000 to \$2.60. DCX-840 \$10.000 to \$2.00. DCX-850 \$15.000 to \$700.000 DCX-861 \$2.000 to \$7.000.000 DCX-861 \$2.000 to \$7.000.000 DCX-861 \$2.000 to \$7.000 to \$7.000 DCX-861 \$2.000 to \$7.000 to \$7.000 DCX-861 \$2.000 to \$7.450 to \$7.45	7
hoenix Digital Corp	BABY NET \$1.450 to \$2.400. DCX-815 \$1.690 to \$2.100. DCX-825 \$3.200 to \$7.200. DCX-840 \$10.000 to \$2.60. DCX-840 \$10.000 to \$2.00. DCX-850 \$15.000 to \$700.000 DCX-861 \$2.000 to \$7.000.000 DCX-861 \$2.000 to \$7.000.000 DCX-861 \$2.000 to \$7.000 to \$7.000 DCX-861 \$2.000 to \$7.000 to \$7.000 DCX-861 \$2.000 to \$7.450 to \$7.45	7
hoenix Digital Corp	BABY NET \$1,450 to \$2,400 to \$2,100 to \$2,000	2
Aradyne Corp.  Thoonix Digital Corp.  Acad-Milgo, Inc.  Acad-Vadic  Acad-Vadic  Acadom of the Corp.	BABY NET \$1.450 to \$2.40.  DCX-815 \$1.690 to \$2.10.  DCX-826 \$3.200 to \$7.20.  DCX-840 \$10.000 to \$2.50.  DCX-840 \$10.000 to \$2.50.  DCX-881 \$2.200 to \$7.00.  DCX-881 \$2.200 to \$7.00.  DCX-881 \$2.200 to \$7.00.  DCX-881 \$2.200 to \$7.00.  DCX-881 \$2.200 to \$8.40.  DCX-871 \$4.500 to \$8.40.  MP-14 4 SM \$4.500 to \$8.40.  SAP 1101 \$5.40.  SAP 1101 \$5.90.  SAP 1102 \$5.90.  SAP 1102 \$5.90.  SAP 1102 \$5.90.  SAP 1104 \$1.450 to \$2.40.  SAP 1106 \$5.250.  SAP 1106 \$1.450 to \$2.20.  SAP 1100 \$1.450 to \$2.20.  SAP 1100 \$1.450 to \$2.20.  SAP 1200 \$5.20.  SAP 1200 to \$2.00.  SAP 1200 to \$2.0	7
Phoenix Digital Corp Prentice Corp.  Lacal-Miligo, Inc.  Lacal-Vadic Litzon, Inc.	BABY NET \$1,450 to \$2,400 to \$2,100 to \$2,200 to \$7,200	2
Phoenix Digital Corp Prentice Corp.  Lacal-Miligo, Inc.  Lacal-Vadic Litzon, Inc.	BABY NET \$1.450 to \$2.40. DCX-815 \$1.690 to \$2.10. DCX-826 \$3.200 to \$7.20. DCX-840 \$10.000 to \$2.60. DCX-840 \$10.000 to \$2.60. DCX-881 \$2.200 to \$7.20. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$8.60. DCX-871 \$4.500 to \$2.40. SNP 1101 \$600. SNP 1102 \$3.00. SNP 1102 \$3.00. SNP 1104 \$51.450. SNP 1106 \$51.450. SNP 1208 \$1.495 to \$2.20. SNP 1208 \$2.205 to \$2.25. SNP 1208 \$5.1,495 to \$2.400 to \$2.40	7
Phoenix Digital Corp Prentice Corp.  Lacal-Miligo, Inc.  Lacal-Vadic Lixon, Inc.  Scitec Corp.  Feleprocessing Products, Inc.	BABY NET \$1,450 to \$2,400 to \$2,100 to \$2,200 to \$7,200	7
Phoenix Digital Corp Prentice Corp.  Recal-Miligo, Inc.  Recal-Vadic Rixon, Inc.  Scitec Corp.  Feleprocessing Products, Inc.	BABY NET \$1.450 to \$2.40. DCX-815 \$1.690 to \$2.10. DCX-825 \$3.200 to \$7.20. DCX-840 \$10.000 to \$2.60. DCX-840 \$10.000 to \$2.60. DCX-881 \$2.200 to \$7.20. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$7.00. DCX-881 \$2.200 to \$3.00. DCX-871 \$4.500 to \$8.00 MP-14.4 SM \$1.400 to \$2.200 SP-1100 \$1.450 to \$2.400 SNP 1101 \$9.00 SNP 1102 \$9.00 SNP 1102 \$9.00 SNP 1104 \$1.400 SNP 1104 \$1.400 SNP 1106 \$1.400 SNP 1106 \$1.400 SNP 1108 \$1.400 to \$2.200 SNP 1209 \$2.005 to \$2.200 SNP 1209 \$2.005 to \$2.200 SNP 1209 \$2.005 to \$2.200 SNP 1200 \$1.400 to \$2.000 ONNIMIAUX 80 \$1.400 to \$2.000 ONNIMIAUX 80 \$1.600 to \$2.000 ONNIMIAUX 80	7
Phoenix Digital Corp Prentice Corp.  Iscal-Willigo, Inc.  Iscal-Vadic Itixon, Inc.  Icitec Corp.	BABY NET \$1.450 to \$2.400 to \$2.100 DCX-815 \$1.690 to \$2.100 DCX-815 \$1.690 to \$2.100 DCX-826 \$3.200 to \$7.200 DCX-826 \$3.200 to \$7.200 DCX-826 \$1.000 to \$8.200 DCX-826 \$1.000 to \$8.200 DCX-826 \$2.200 to \$7.200 DCX-826 \$2.200 to \$7.200 DCX-826 \$2.200 to \$7.200 DCX-827 \$4.500 to \$3.200 to \$3.200 DCX-827 \$4.500 to \$3.200 to \$3.200 DCX-827 \$4.500 to \$3.200 to \$3.200 DCX-827 \$4.500 to \$3.200 DCX-827 \$1.450 to \$2.400 DCX-827 \$1.450 to \$2.400 DCX-827 \$1.450 to \$2.400 DCX-827 \$1.450 to \$2.200 DCX-8	7

VENDOR	MODEL PRIC	E PA	AGE
Timentax, Inc.	QUAD SWITCHING MICROPLEXER \$7.52	5 A	-95
	SERIES II MICROPLEXER M8	0 A	-95
	SERIES II MICROPLEXER M24		
	SERIES II MICROPLEXER M48	0 A	-95
	SWITCHING MICROPLEXER SMB	5 A	-95
	SWITCHING MICROPLEXER SM24 \$2.830 to \$3.85		
	SWITCHING MICROPLEXER SM48		
	WIDEBAND MICROPLEXER WM48		
Western Detecom	PRISM 1003 \$87		
Xyplex, Inc.	XYPLEX SYSTEM\$70	0 A	-96

# **Time-Division Multiplexers**

DV/16 DZ16 DZ16 DZ16 DZ16 DZ16 DZ16 DZ26 DZ26 DZ26 DZ26 DZ26 DZ26 DZ26 DZ2	\$3,750 to \$4,500 \$8,000 to \$1,000 \$3,200 to \$3,950 \$3,750 to \$4,500 \$3,750 to \$4,500 \$3,750 to \$4,500 \$2,750 to \$4,500 \$2,750 to \$4,500 \$2,79 to \$649 \$2,70 to \$649 \$2,70 to \$649 \$2,70 to \$649 \$1,150 MULTIPLEXORS \$1,650 to \$2,250 \$5,000 MULTIPLEXOR \$3,000 \$4,500 MULTIPLEXOR \$3,000 \$3,000 MULTIPLEXOR \$3,000 to \$4,500 MULTIPLEXOR \$3,000 to \$4,500 MULTIPLEXOR \$3,000 to \$4,500 MULTIPLEXOR \$3,000 to \$4,950 MULTIPLEXOR \$3,000 to \$3,000 MULTIPLEXOR MODEL 2035 \$2,000 to \$3,000 MULTIPLEXOR MODEL 2135 \$2,000 to \$3,000 MULTIPLEXOR MODEL 2135 \$2,000 to \$3,000 \$3	A-686 A-686 A-686 A-686 A-686 A-707 A-777 A-777 A-777 A-777 A-777 A-88 A-88
DV/16 DZ16 DZ16 DZ16 DZ16 DZ16 DZ16 DZ16 DZ	\$8,000 to \$1,000 \$2,200 to \$3,950 \$3,750 to \$4,500 \$3,750 to \$4,500 \$3,750 to \$4,500 \$279 to \$54,000 \$3,000 \$4,500 \$4,500 \$5,000	A-88 A-88 A-88 A-88 A-87 A-77 A-77 A-77
DZ16 VMZ32N VMZ32N VMZ32N VMZ32N Z211 TDM MULTIF Bay Technical Associates, Inc. S24E S24E S24E S28E S28E S28E S28E S29E S29E S29E S29E S29E S29E S29E S29	\$3,200 to \$3,950 \$3,750 to \$4,500  EXER \$7,500 to \$5,000 \$279 to \$4,500 \$279 to \$4,500 \$279 to \$4,900 \$4,500 NOUS MULTIPLEXORS \$1,650 to \$2,250 SMULTIPLEXOR \$5,000 NICATIONS CONCENTRATOR \$5,000 NICATIONS CONCENTRATOR \$3,000 NICATIONS \$3,000 to \$4,950 \$1,550 NIMUXB \$650 to \$850 MULTIPLEXER MODEL 203S \$1,000 to \$5,000 MULTIPLEXER MODEL 203S \$2,000 to \$3,000 MULTIPLEXER MODEL 213S \$2,000 to \$3,000 \$5995 to \$1,295 \$5900	A-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6
Imidabl Corp.  2211 TDM MULTI Bay Technical Associates, Inc. 524 AC 11 528 AC 11 528 E  Black Box Catalog/Expander, Inc. 524 E  528 AC 11 528 E  Black Box Catalog/Expander, Inc. ASYNCHRONOUS ( MX-1  Codex Corp. Bo Sherrel Co., Inc. 604 605 SYNCHR B0 SYNCHRONOUS ( MX-1  Codex Corp. B0 SYNCHRONOUS ( MX-1  CODEX Corp. B0 SYNCHRONOUS ( B1 SYNCHRONO	\$3.750 to \$4.500  EXER \$7.500 to \$50,000  \$279 to \$640  \$279 to \$649  \$270 to \$649  \$450 to \$625  \$450 to \$650  \$500 to \$650  \$450 to \$650  \$4	A-88 A-88 A-87 A-77 A-77 A-77 A-77 A-88 A-88
Limidabl Corp.  Bay Technical Associates, Inc.  524 A C 11  524 E .  528 A C 11  528 E .  528 A C 11  528 E .  528 A C 11  528 C .  529 C .  520 C	EXER \$7.500 to \$50,000 \$279 to \$849 \$270 to \$850 \$270 to \$8500 \$270 to \$85000	A-88 A-88 A-88 A-78 A-78 A-78 A-78 A-78
Bay Technical Associates, Inc.  524 AC 11 528 E 60	\$279 to \$849 \$279 to \$849 \$279 to \$844 \$279 to \$849 \$279	A-68 A-68 A-68 A-77 A-77 A-77 A-77 A-77 A-77 A-77 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8
S24E   S28E   S28AC 11   S28AC 11   S28AC 12   S28AC 11   S28AC 12   S28AC	\$279 to \$849 \$327 to \$849 \$485 \$485 \$485 \$485 \$485 \$485 \$485 \$485	A-68 A-68 A-70 A-70 A-72 A-72 A-72 A-72 A-72 A-74 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8 A-8
S28 AC 11   S28 E	\$279 to \$849 \$279 to \$849 \$279 to \$849 \$279 to \$849 \$459 to \$489 \$450 to \$495 \$450	A-85 A-70 A-70 A-70 A-70 A-70 A-70 A-70 A-70
lisek Box Cataleg/Expander, Inc.  SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS BOS SYNCHRONO BOS SYNCHRONO BOS SYNCHRONO BOS SYNCHRONO BOS SYNCHRONO SYNCHRONOUS CHANNEL COMM CH	\$279 to \$849 CHANNEL SPLITTER \$635 HANNEL SPLITTER \$535 HANNEL SPLITTER (SCS-4) \$1,150  NOUS MULTIPLEXORS \$1,850 to \$2,250 SMILITIPLEXOR \$4,500 NULTIPLEXOR \$5,000 NICATIONS CONCENTRATOR \$5,000 NICATIONS CONCENTRATOR \$3,000 NICATIONS CONCENTRATOR \$3,000 NICATIONS CONCENTRATOR \$3,000 NICATIONS CONCENTRATOR \$3,000 NICATIONS \$3,000 to \$4,950 NIVISION MULTIPLEXOR \$3,000 to \$4,950 NIVISION MULTIPLEXOR \$5,000 to \$3,000 MULTIPLEXER MODEL 2033 \$1,000 to \$3,000 MULTIPLEXER MODEL 2133 \$2,000 to \$3,000 MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 S5000 S5000 S5000 S5000 S5000 S5000	A-65 A-70 A-70 A-72 A-73 A-74 A-74 A-76 A-81 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Black Box Catalog/Expander, Inc.  ASYNCHRONOUS ( NAC)  SYNCHRONOUS ( NAC)  Codex Corp.  Bo Sherrel Ca., Inc.  Bo Go SYNCHRONOUS ( Bo Batable, Inc.  Bo Batable, Inc.  Bo Batable, Inc.  Bo Bo SYNCHRONOUS ( Bo Bo SYNCHRONOUS ( Bo SYNCHRONOUS ( BO BO SYNCHRONOUS ( BO BO SYNCHRONOUS ( BO BO SYNCHRONOUS ( BO B	CHANNEL SPLITTER \$635 HANNEL SPLITTER (SCS-4) \$1,150  NOUS MILTIPLEXCRS \$1,850 to \$2,250 IS MILTIPLEXCR \$5,450  MILTIPLEXCR \$5,000  MILTIPLEXCR \$5,000  MILTIPLEXCR \$5,000  NICATIONS CONCENTRATOR \$5,005  (8 DATA TDM N/A  VISION MILTIPLEXCR \$3,895  VISION MILTIPLEXCR \$3,890 to \$4,950  MILTIPLEXER MODEL 2033 \$5,000 to \$3,000  MILTIPLEXER MODEL 2035 \$2,000 to \$3,000  MILTIPLEXER MODEL 2135 \$2,000 to \$3,000  2577(258) \$900  \$9905 to \$1,295  \$9000	A-70 A-70 A-72 A-73 A-73 A-74 A-74 A-76 A-80 A-81 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Black Box Catalog/Expandor, Inc.  ASYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS SYNCHRONOUS Bosharral Co., Inc.  MX-1  Bosharral Co., Inc.  MX-1  Bosharral Co., Inc.  Bosharral Co., Inc.  Bosharral Co., Inc.  Bosharral Co., Inc.  Bosharral Communications Specialists, Inc.  CHANNEL COMM COMMUNICATION  CHANNEL COMM COMMUNICATION  CIS BMLX  MODEL 925 TELE  BODE 9100  T-1 SPEED TIME I  GLM 504  LINE MISER-MLX  ASYNCHRONOUS ASYNCHRON	CHANNEL SPLITTER \$635 HANNEL SPLITTER (SCS-4) \$1,150  NOUS MILTIPLEXCRS \$1,850 to \$2,250 IS MILTIPLEXCR \$5,450  MILTIPLEXCR \$5,000  MILTIPLEXCR \$5,000  MILTIPLEXCR \$5,000  NICATIONS CONCENTRATOR \$5,005  (8 DATA TDM N/A  VISION MILTIPLEXCR \$3,895  VISION MILTIPLEXCR \$3,890 to \$4,950  MILTIPLEXER MODEL 2033 \$5,000 to \$3,000  MILTIPLEXER MODEL 2035 \$2,000 to \$3,000  MILTIPLEXER MODEL 2135 \$2,000 to \$3,000  2577(258) \$900  \$9905 to \$1,295  \$9000	A-70 A-70 A-72 A-73 A-73 A-74 A-74 A-76 A-80 A-81 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Bo-Sherrel Co., Inc.  SYNCHRONOUS  MX-1  Codex Corp.  Bo 460 SYNCHRO  BR 57NCHRON  BR 57NCHRON  BR 57NCHRON  BR 57NCHRON  BR 57NCHRON  Computer Communications Specialists, Inc.  CHANNEL COMM  Computer Inquiry Systems, Inc.  CIS BMUX.  Datable, Inc.  MODEL 925 TELE  BMUX.  DEBAUX.  MODEL 925 TELE  BMUX.  MODEL 925 TELE  BMUX.  MODEL 925 TELE  BMUX.  MODEL 925 TELE  BMUX.  ANDEL 925 TELE  BMUX.  MODEL 925 TELE  BMUX.  MODEL 925 TELE  BMUX.  ANDEL 925 TELE  BMUX.  MEGANIX.  CHAN 504  LINE MISER-MILX.  ASYNCHRONOUS  AS	HANNEL SPLITTER (SCS-4)  \$1,150 \$495  NOUS MULTIPLEXORS \$1,850 to \$2,250  SS MULTIPLEXOR \$4,500  MULTIPLEXOR \$5,000  NICATIONS CONCENTRATOR \$3,000  (& DATA TDM \$1,850  (VISION MULTIPLEXOR \$3,800 to \$4,950  VIVISION MULTIPLEXOR \$3,800 to \$4,950  MULTIPLEXER MODEL 2033 \$1,000 to \$3,000  MULTIPLEXER MODEL 2035 \$2,000 to \$3,000  MULTIPLEXER MODEL 2133 \$2,000 to \$3,000  MULTIPLEXER MODEL 2133 \$2,000 to \$3,000  MULTIPLEXER MODEL 2135 \$2,000 to \$3,000  \$3905 \$3905 \$3905 \$3900	A-70 A-72 A-72 A-73 A-74 A-74 A-76 A-80 A-81 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Incherred Co., Inc.  Dediex Corp.  Society Corp.  Society Corp.  Society Corp.  Society Commission Specialists, Inc.  Computer Commission Specialists, Inc.  Channel Code, Computer Systems, Inc.  Channel Code, Computer Systems, Inc.  Channel Code,	NOUS MULTIPLEXORS \$1,850 to \$2,250  SMULTIPLEXOR \$4,500  MULTIPLEXOR \$5,000  MULTIPLEXOR \$5,000  MULTIPLEXOR \$5,000  MICRATIONS CONCENTRATOR \$3,695  ( & DATA TDM N/A  VISION MULTIPLEXOR \$3,690 to \$4,950  VISION MULTIPLEXOR \$3,000 to \$4,950  MULTIPLEXER MODEL 2033 \$1,000 to \$3,000  MULTIPLEXER MODEL 2035 \$2,000 to \$3,000  MULTIPLEXER MODEL 2135 \$2,000 to \$3,000  2577(258) \$900 to \$3,000  \$995 to \$1,295  \$900  \$900	A-70 A-72 A-72 A-73 A-74 A-74 A-76 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Ceriex Corp.  50-605 SYNCHR 505 SYNCHRON 500 GROUP BAN Computer Inquiry Systems, Inc. CHAINEL COMM. Computer Inquiry Systems, Inc. CHAINEL COMM. COMMITTED C	INOUS MULTIPLEXORS \$1,850 to \$2,250  \$4,500  MULTIPLEXOR \$4,500  MULTIPLEXOR \$5,000  MULTIPLEXOR \$5,000  MULTIPLEXOR \$5,000  (a DATA TDM \$3,000  (a DATA TDM \$3,000  (b St. DATA TDM \$3,000  MULTIPLEXOR \$3,000 to \$4,950  MULTIPLEXER MODEL 2033 \$1,000 to \$3,000  MULTIPLEXER MODEL 2035 \$2,000 to \$3,000  MULTIPLEXER MODEL 2133 \$2,000 to \$3,000  MULTIPLEXER MODEL 2133 \$2,000 to \$3,000  MULTIPLEXER MODEL 2135 \$2,000 to \$3,000  S500 \$5000  S500 \$5000  S500 \$5000	A-73 A-73 A-73 A-74 A-74 A-74 A-81 A-81 A-81 A-81 A-81 A-81 A-81 A-81
980 SYNCHRONG BOOGROUP BAN BOOG	SMULTIPLEXCR   \$4,500	A-72 A-73 A-73 A-74 A-76 A-86 A-86 A-86 A-86 A-86 A-86 A-86 A-8
Computer Communications Specialists, Inc. CHANNEL COMB Databils, Inc. CHANNEL	> MULTIPLEXOR \$5,000 INICATIONS CONCENTRATOR \$3,695  \$3,005  (8 DATA TDM \$3,000  (9 S\$0,000  (9 S\$	A-73 A-74 A-74 A-75 A-80 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Computer Communications Specialists, inc. CHANNEL COMM Computer Inquiry Systems, inc. CIS BMUX Databit, inc. Databit, inc. DCP 9100 DCATAC T-1 SPEED TIME GLM 504 LINE MISER-MUX ASYNCHRONOUS ASYNCHRONO	NICATIONS CONCENTRATOR \$3,895 \$300  (a DATA TDM N/A \$3,850  (VISION MULTIPLEXOR \$3,800 to \$4,950 \$1,550  (MUX8 \$850 to \$4550  MULTIPLEXER MODEL 2033 \$1,000 to \$3,000  MULTIPLEXER MODEL 2035 \$2,000 to \$3,000  MULTIPLEXER MODEL 2133 \$2,000 to \$3,000  MULTIPLEXER MODEL 2135 \$2,000 to \$3,000  257/1258) \$5,000 to \$3,000 \$995 to \$1,295 \$990	A-73 A-74 A-75 A-75 A-81 A-81 A-81 A-81 A-81 A-81 A-81
Computer Inquiry Systems, Inc.  CIS BMUX Databit, Inc.  MODEL 925 TELE Databit, Inc.  DOCA!7AG  T-I SPEED TIME I Bendair Data, Inc.  GenComp, Inc.  CILM 504  ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS Inflinet, Inc.  MEGAMUX (TDM TDM 1209 SERIE MX400  MX496  MX600  Inforce Systems Corp.  TI MULTIPLEXER TIMELINE 190 MI TIMELINE 290 MI TIMELINE 300 MI T	\$300 ( & DATA TDM	A-74 A-74 A-75 A-86 A-86 A-81 A-81 A-81 A-81 A-81 A-81
Computer Inquiry Systems, Inc.  Cis BMUX Databils, Inc.  Dotatable, Inc.  Dotatable, Inc.  Dotatable, Inc.  Dotatable, Inc.  Dotatable, Inc.  Dotatable, Inc.  Glaf 504  LINE MISER-MUX ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS Inflient, Inc.  MEGAMUX (TDM 100 1200 SERIE MAY400  MA	( & DATA TOM N/A \$3.850   VISION MULTIPLEXOR \$3.850   VISION MULTIPLEXOR \$3.800 to \$4.950   \$1,550   MUX8 \$850 to \$850   MULTIPLEXER MODEL 2033 \$1,000 to \$3,000   MULTIPLEXER MODEL 2035 \$2,000 to \$3,000   MULTIPLEXER MODEL 2133 \$2,000 to \$3,000   MULTIPLEXER MODEL 2135 \$2,000 to \$3,000   257/1258) \$8,000 to \$3,000   \$995 to \$1,295   \$900	A-74 A-75 A-86 A-86 A-81 A-81 A-81 A-81 A-81
Databit, Inc.  Databit, Inc.  DCA 736  DCA/736  T-1 SPEED TIME Gandelf Data, Inc.  GLIA 504  LINE MISER-AUX ASYNCHRONOUS Inflinet, Inc.  MEGAMUX (TDM TDM 1209 SERIE MA400  MA500  Infotron Systems Corp.  T1 MULTIPLEXER TIMELINE 180 MI TIMELINE 280 MI MODEL 6800  Interall Systems, Inc.  5300  Interall Systems, Inc.  1024  LEID Systems, Inc.  407 SYSTEM MIA-COME Linkabit, Inc.  MX 48  MICON Systems, Inc.  INSTATRUNK480 M4096/4+ MICROTOO MODE  MICROTOO MODE  LINE STATRUNK480 M4096/4+ MICROTOO MODE MICROTOO MODE MICROTOO MODE MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTOO MODE  MICROTO MODE	( & DATA TOM N/A \$3.850   VISION MULTIPLEXOR \$3.850   VISION MULTIPLEXOR \$3.800 to \$4.950   \$1,550   MUX8 \$850 to \$850   MULTIPLEXER MODEL 2033 \$1,000 to \$3,000   MULTIPLEXER MODEL 2035 \$2,000 to \$3,000   MULTIPLEXER MODEL 2133 \$2,000 to \$3,000   MULTIPLEXER MODEL 2135 \$2,000 to \$3,000   257/1258) \$8,000 to \$3,000   \$995 to \$1,295   \$900	A-74 A-75 A-86 A-86 A-81 A-81 A-81 A-81 A-81
Datatel, Inc.  DCP 9100  DCA/TAC  T-1 SPED TIME  Bandaif Data, Inc.  LINE MISER-MUX  GenComp, Inc.  ASYNCHRONOUS  Inflinet, Inc.  MK400  MK600  MK600  MK600  MK600  MK6000  MK6000	\$3,850 to \$4,950   IVISION MULTIPLEXOR \$3,800 to \$4,950   ### \$1,550	A-75 A-76 A-86 A-81 A-81 A-81 A-81 A-81
DCA/TÄG T-I SPEED TIME Gendelf Data, Inc. GLM 504 LINE MISER-MUX GenComp, Inc. ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS ASYNCHRONOUS TO 1209 SERIE Inflinet, Inc. MK400 MK400 MK400 MK400 MK600 Infotron Systems Corp. T1 MULTIPLEXER TIMELINE 180 MI TIMELINE 180 MI TIMELINE 280 MI MK600 Interactive Systems/3MI MCDCL 6000 Interactive Systems, Inc. S300 LITT D424 MK 48 MK7A-COME Linkabilt, Inc. MX 48 MK7A-COME Linkabilt, Inc. MX 48 MK600 MK6000 MK60000 MK6000 MK6	IVISION MULTIPLEXOR \$3,800 to \$4,950   \$1,550   INUX8 \$\$550 to \$850 to \$800 to \$3,000 to \$	A-76 A-86 A-81 A-81 A-81 A-81 A-81
Gendelf Data, Inc.  LINE MISER-MUX GenComp, Inc.  ASYNCHRONOUS ASYNCHR	\$1,550	A-80 A-81 A-81 A-81 A-81 A-81
GenComp, Inc.  ASYNCHRONOUS ASY	MUX8 \$650 to \$450 MULTIPLEXER MODEL 2033 \$1,000 to \$3,000 MULTIPLEXER MODEL 2035 \$2,000 to \$3,000 MULTIPLEXER MODEL 2035 \$2,000 to \$3,000 MULTIPLEXER MODEL 2133 \$2,000 to \$3,000 2571/258) \$6,000 to \$5,000 2571/258) \$995 to \$1,295 \$990 \$3,000	A-80 A-81 A-81 A-81 A-81
GenComp, Inc.  ASYNCHRONOUS Inflient, Inc.  MK400  MMCDEL 6800  Interall Systems, Inc. 5000  ITT D424  LED Systems, Inc. MK 24  MK 26  MK 26	MULTIPLEXER MODEL 2033 \$1,000 to \$3,000 MULTIPLEXER MODEL 2035 \$2,000 to \$5,000 MULTIPLEXER MODEL 2133 \$900 MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 257/1258) \$6,000 to \$35,000 257/1258) \$995 to \$1,295 \$300 \$800	A-81 A-81 A-81 A-81
ASYNCHRONOUS ASYNC	MULTIPLEXER MODEL 2035 \$2,000 to \$3,000 MULTIPLEXER MODEL 2133 \$900 MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 2577(258) \$6,000 to \$3,000 2577(258) \$995 to \$1,295 \$995 to \$1,295 \$900	A-81 A-81 A-81
ASYNCHRONOUS	MULTIPLEXER MODEL 2133 \$900 MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 257/1258) \$6,000 to \$35,000 \$995 to \$1,295 \$300 \$300	A-81 A-81 A-81
ASYNCHRONOUS	MULTIPLEXER MODEL 2133 \$900 MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 257/1258) \$6,000 to \$35,000 \$995 to \$1,295 \$300 \$300	A-81 A-81 A-81
ASYNCHRONOUS   General Datacomm Industries, Inc.   MSGAMUX (TDM	MULTIPLEXER MODEL 2135 \$2,000 to \$3,000 257/1258) \$6,000 to \$35,000 \$995 to \$1,295 \$300 \$300	A-81
MEGAMUX (TDM   TDM 1209 SERIE   MK400	257/1258) \$6,000 to \$35,000 \$995 to \$1,295 \$300 \$800	A-81
Inflinet, Inc.	\$995 to \$1,295 \$300 \$800	
Infinet, Inc. MX400  MX496  MX600  Infotron Systems Corp. T1 MULTIPLEXER  TIMELINE 280 M  TIMELINE 280 M  TIMELINE 280 M  TIMELINE 280 M  ODEL 6800  Interall Systems, Inc. 5300  FTT D424  LED Systems, Inc. 407 SYSTEM  M/A-COM Linkabit, Inc. MX 24  MX 24  MX 48  Milcom Systems, Inc. INSTANUX470 M  INSTATRUNK480  M4086/4+ MICROTOO LINE I  MICROTOO LINE I  MICROTOO LINE I  MICROTOO LINE I	\$300 \$800	
MX496		
MK600		
MK600		A-82
Infotron Systems Corp.		
TIMELINE 180 MI TIMELINE 280 MI MODEL 6800 Interall Systems, Inc. 5000 ITT D424 LLD Systems, Inc. 407 SYSTEM M/A-COM Linkabit, Inc. MX 24 MICOM Systems, Inc. INSTANUX470 MI INSTATRUNK480 M4096/4+ MICROTOO LINE I	\$4.800	
TIMELINE 280 M/   TIMELINE 2	TIPLEXER \$1,700	
TIMELINE 290 MI   MODEL 6600   Interall Systems/3M   MODEL 6600   Interall Systems, Inc.   5300   FTT   D424   LED Systems, Inc.   407 SYSTEM   MI/A-DOM Linkabit, Inc.   MX 24   MI 24   MX 48   MI 24   MX 48   MI 25   MX 48   MI 25   MX 48   MX		
Interactive Systems/3M	TIPLEXER \$1,800	
Interest Systems, Inc.   5300	TIPLEXER \$1,950	
### D424 LED Systems, Inc. 407 SYSTEM M/A-DOM Linkabit, Inc. MX 24 MX 48 Milcom Systems, Inc. INSTANUATO M INSTATRUNK480 M4096/4+ MICROTOO LINC MICROTOO LINC MICROTOO LINC	\$1,600 to \$3,090	
LED Systems, Inc.   407 SYSTEM     M/A-DOM Linkabit, Inc.   MX 48     Milcom Systems, Inc.   INSTAMUA470 M     INSTAMUA470 M     M4096/4 +       MICRO100 LINE     MICRO700 MODE	\$1,500 to \$2,250	
LED Systems, Inc.   407 SYSTEM     M/A-COM Linkabit, Inc.   MX 48     Milcom Systems, Inc.   INSTAMUA470 M     INSTAMUA470 M     M4096/4 +	\$5,000 to \$50,000	A-85
M/A-COM Linkabit, Inc. MX 24 MX 49 Milcom Systems, Inc. INSTAMUX470 M INSTATRUNK480 M4096/4+ MICROTOD LINE MICROTOD LINE	\$13.550	
MX 48.  INSTAMUX470 M INSTATRUNI488  M4096/4 + MICRO100 LINE I MICRO700 MOD6	\$2,700 to \$5,000	
Milcom Systems, Inc. INSTANLIX470 MI INSTATRUNK480 M4096/4+ MICRO100 LINE I MICRO700 MODE	\$5,600	
INSTATRUNK480 M4096/4 +		
M4096/4+ MICRO700 LINE I MICRO700 MODE	L M474 OR 478 \$695 to \$1,050	
MICRO100 LINE MICRO700 MODE	MODEL M481 \$3,200 to \$12,600	
MICRO700 MODE		. A-87
	ULTIPLEXER \$4,300 to \$6,400	. A-87
	M700 N/A	. A-8
	1 OR 2 \$2.500 to \$10.000	
	UX \$1,300	
Paradyne Corp. DCX-T1		. A-8
	\$4,000	
	\$4,000 \$2,740 to \$4,750	
	\$4,000 \$2,740 to \$4,750 \$875	
	\$4,000 \$2,740 to \$4,750 \$875 \$1,295	
OMX-5600	\$4,000 \$2,740 to \$4,750 \$975 \$1,295 \$2,395	. A-9
OMX-9600	\$4,000 \$2,740 to \$4,750 \$875 \$1,295	. A-9
Phoenix Digital Corp DPAC/PTX-1	\$4,000 \$2,740 to \$4,750 \$975 \$1,295 \$2,395	. A-9

VENDOR	MODEL	PRICE	PAGE
Phoenix Digital Corp	DPAC-30	\$5,000 to \$9,000	A-90
Rianda Electronics	MODEL 1600	\$360 to \$1,900	A-81
Rixon, inc.	MODEL 2600		
Scitec Corp.			
Tau-Trou, Inc.	INTRAPLEX TDM 150	\$3,500 to \$8,000	A-94
Telmac, Inc			
Timopiex, Inc.			
	TIMEPLEXER TIG TDM		
	TIMEPLEXER T-20 TDM		
	TIMEPLEXER T-96 TDM		
Wang Laboratories, Inc	CMUX-2370 CABLE MULTIPLEXOR	\$3,375	A-96

# Wideband (T-1) Multiplexers

VENDOR	MODEL	PRICE	PAGE
Avanti Communications Corp	ULTRAMUX	\$15,750	 A-68
	D/I MUX		
Gendelf Data, Inc.	LINE MISER-T1 MICK	\$3,200	4-80

# Other Multiplexer Types

VENDOR	MODEL	PRICE	PAG
Astrocom Corp			
	SQUEEZIPLEXER-STAND ALONE	\$1,022	A-6
Canoga Data Systems	CMX-832	\$2,700 to \$8,700	A-7
Interface Electronics, Inc.			
Micom Systems, Inc.	MICRO 860 CONCENTRATOR SWITCH		A-8
Mitel, Inc.	MITEL DATA DEMULTIPLEXER	\$850	A-8
Optolocom			
•	5100-8	\$6,200	A-8
Periphonics Corp			
	VOICE STAR		
	VOICEPACK		
Sierra Research Corp			
Sperry Corp.			
Tellabs, Inc.			
Timeplex, Inc.			

#### ABLE COMPUTER

DH/DM Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24, CCITT V.28 Transmission Mode: Full-Dupley Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps **Maximum Output Lines:** 

Synchronous: 16 Output Transmission Mode: Full-Duplex Features: Flow Control, Programmable Diagnostic Feats Price: \$3,750 to \$4,500 Date First Installed: 1981 (See Vendor Profile Page V-1)

#### ARLE COMPUTER DV/16

Multiplexer Class: TDM Maximum Input Che Synchronous: 32

Asynchronous: 32 Asynchronous - 50 bps, 75 bps, 110 bos. 300 bps, 600 bps, 1,800 bps, 7,200 bps, 19,200 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 3,600 bps, 4,800 bps. 9.600 bps Aggregate Transmission Rate: 300 Maximum Output Lines:

Synchronous: 4 Asynchronous: 4 **Output Transmission Mode: Half-**Duplex, Full-Duplex Distribution Method: Third-party Price: \$8,000 to \$11,000

#### ABLE COMPUTER

Input Interface: RS-232C, CCITT V 24/V 28 Meximum Input Channels:

Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rate Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Maximum Output Lines:

Synchronous: 16 **Output Transmission Mode: Full-**Duplex Features: Programmable Diagnostic Features: Local Distribution Method: Third-party Price: \$3,200 to \$3,950 Date First installed: 1980 Number Installed to Date: 100 - 500

#### ABLE COMPUTER VMZ/3294

Multiplexer Class: TDM input Interface: RS-232C, CCITT V 24/V 28 Maximum Input Channels:

Synchronous: 16 nission Mode: Full-Duplex Input Transmission Rates Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19 200 bps Maximum Output Lines:

Synchronous: 16 Output Transmission Mode: Full-Duplex Features: Flow Control, Diagnostic Features: Local Distribution Method: Third-party Price: \$3,750 to \$4,500 Date First installed: 1982

2211 TOM MULTIPLEXER Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28, V.35, MIL 188C, Bell 301/303 **Maximum Input Channels:** 

Synchronous: 48 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 1,800 bps; Asynchronous/Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 14,400 bps, 19,200 bps, 460.8K bps Aggregate Transmission Rate: 13,440 bps **Maximum Output Lines:** 

Asynchronous: 1 Output Transmission Mode: Full-**Output Line Trans** Synchronous - 9,600 bps, 14,400 bps, 56,000 bps; Asynchronous - T-Asynchronous/Synchronous -40,800 bps, 2,048K bps Communications Protocols: Ascii. Protocol Transparent Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Operational and Statistical Reports, Programmable, Network Monitor, Soft Configurability Diagnostic Features: Remote, Local Distribution Method: End user Price: \$7.500 to \$50.000 Date First Installed: May 1983 Number Installed to Date: Under 100 (See Vendor Profile Page V-2)

ASTROCOM CORP SQUEEZIPLEXER-STAND ALONE Multiplexer Class: IBM 3274 Coaxial Cable Eliminator Input Interface: Coaxial Cable, RG-62A/U

Maximum Input Channels: Synchronous: 8 Transmission Mode: Half-Duplex Input Transmission Rates: Asynchronous - 2M bps Aggregate Transmission Rate: 20K Maximum Output Lines:

Synchronous: 1 **Output Transmission Mode: Half-**Duplex **Output Line Transmission Rates:**  Asynchronous - 2M bps Features: Polling, Operational and Statistical Reports, Network Monitor Distribution Method: Third-party Price: \$1.022 Date First Installed: January 1983 Number Installed to Date: 500 -1.000 (See Vendor Profile Page V-3)

ASTROCOM CORP. SQUEEZIPLEXER-RACK MOUNT Multiplexer Class: IBM 3274 Coaxial Cable Eliminator **Maximum Input Channels:** 

Synchronous: 32 **Maximum Output Lines:** 

Features: Polling, Operational and Statistical Reports, Network Monitor Diagnostic Features: Local Distribution Method: Third-party Price: \$2.860 Date First Installed: January 1983 Number installed to Date: 500 -

# AVANTI COMMUNICATIONS

ULTRAMUX Multiplexer Class: Wideband (T-1) Input Interface: RS-232C, MIL 188C, V.35, RS-449, Bell 303 **Maximum Input Chang** Synchronous: 128

Asynchronous: 64 | Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 2.5M

bps Aggregate Transmission Rate: 1M

Maximum Output Lines: **Output Transmission Mode: Full-Output Line Tran** Synchronous - 56,000 bps; Asynchronous/Synchronous - 10M

Features: Automatic Sp Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, T-1 Capability, Dynamic Band Width

Diagnostic Features: Remote, Local Distribution Method: End user, OEM, Third-party Date First Installed: March 1983 Number Installed to Date: Under (See Vendor Profile Page V-3)

**BACKUS DATA SYSTEMS** SWITCHABLE/STATISTICAL MULTIPLEXER Multiplexer Class: Statistical input Interface: RS-232C Maximum Input Channels:

Programmable Diagnostic Features: No Distribution Method: End user Synchronous: 4 Price: \$1,995 Date First Installed: September 1083 Number installed to Date: Under (See Vandor Profile Page V-3)

#### BAY TECHNICAL ASSOCIATES, INC. 524 AC 11

Multiplexer Class: TDM Input Interface: RS-232C **Maximum Input Channels:** 

Transmission Mode: Full-Duplex Input Transmission Rates:

Synchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps,

1.800 bps. 2.400 bps. 3.600 bps.

4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96

Output Transmission Mode: Full-

**Output Line Transmission Rates:** 

Communications Protocols: SDLC

Features: Switching, Operational

Maximum Output Lines:

Asynchronous - 9,600 bps

Synchronous: 1

Duplex

Synchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rate Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Synchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Asynchronous - 1,200 bps, 1,800 bps. 2,400 bps. 4,800 bps. 9,600 bps. 14,400 bps Communications Protocols: Ascii Features: Flyback Buffering Delay, Polling, Programmable Diagnostic Features: Local Distribution Method: End user Price: \$279 to \$649 **Date First installed:** September Number Installed to Date: 5,000 -10 000 (See Vendor Profile Page V-4)

BAY TECHNICAL ASSOCIATES, INC.

524E lexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Synchronous: 4 mission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Synchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:**  bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps 14,400 bps 14,400 bps 16 bps 16,500 bps

Asynchronous - 1.200 bos. 1.800

Number installed to Date: 5,000 - 10,000

BAY TECHNICAL ASSOCIATES, INC. 528 AC 11 Multiplexer Cless: TDM Input Interface: RS-232C Maximum Input Chennels: Synchronous: 8

Synchronous: 8
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 600 bps, -1,200
bps, 1,800 bps, 2,400 bps, 3,600
bps, 4,800 bps, 7,200 bps, 9,600
bps, 19,200 bp
Maximum Output Lines:

Synchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600

hps
Communications Protocols: Ascil
Features: Flyback Buffering Delay,
Polling, Programmable
Diagnostic Features: Local
Distribution Method: End user
Price: \$279 to \$649

Date First Installed: September 1982 Number Installed to Date: 5,000 -10.000

BAY TECHNICAL ASSOCIATES, INC.

528E Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,300 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Maximum Output Lines: Synchronous: 1

Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Communications Protocols: Ascii Features: Polling, Programmable

Diagnostic Features: Local Distribution Method: End user Price: \$279 to \$649 Date First Installed: September 1982

or Installed to Date: 5,000 -

10,000

BELDEN CORP.
BIT-DRIVER 222-006
Multiplexer Class: Fiber-Optic

Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Synchronous: 8
Asynchronous: 8
Transmission Mode: Full-Duplox
Input Transmission Rates:
Asynchronous/Synchronous - 1,200
bps: 2,400 bps, 4,800 bps, 9,600
bps: 19,200 bps
Aggregate Transmission Rate:
1,500 bps
Output Transmission Mode: Full-

Duplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 1,200
bps, 4,800 bps
Communications Protocols:
Transparent

Features: Independent Channel Loopback Diagnostic Features: Local Diarribution Method: Third-party Price: \$1,950 Date First Installed: June 1983 Number installed to Date: Under 100

(See Vendor Profile Page V-4)

BLACK BOX CATALOG/EXPANDOR, INC. SYNCHRONOUS CHANNEL SPLITTER (SCS-2) Multiplexer Class: FDM Input Interface: RS-232C Maximum Input Channels:

Maximum Input Channels: Asynchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - Up to 9,600 bps

Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Transmission Rates:
Asynchronous/Synchronous - Up to
9,600 bps
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Automatic Repeat
Request, Port Contention,
Operational and Statistical Reports,
Flow Control
Diagnostic Features: Remote, Local
Distribution Method: End user
Prices: \$355

Date First Installed: August 1982 Number Installed to Date: 100 - 500 (See Vendor Profile Page V-4)

BLACK BOX CATALOQ/EXPANDOR, INC. DATA CONCENTRATOR 2 Multiplexer Class: Statistical input Interface: RS-232C, DCE Maximum Input Chennels:

Synchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 9,600 bps Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Synchronous: 1
Asynchronous: 1
Output Transmission Mode: FullDutput Line Transmission Rates:
Asynchronous - 1,200 bps, 1,800

bps, 9,600 bps, Asynchronous/Synchronous - As Per Modern Speed Communications Protocols: BSC Peatures: Data Compression,

Features: Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control Diagnostic Features: Remote, Local Price: \$1,050 Date First Installed: 1978 Number Installed to Date: 10,000

BLACK BOX CATALOG/EXPANDOR, INC. DATA CONCENTRATOR 2HP Multiplexer Class: Statistical Input Interface: RS-232C, DCE Maximum Input Channels:

Synchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 9,600 bps Aggregate Transmission Rate: 192 bps

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,600 bps: Asynchronous/Synchronous - As per

Modern Speed Communications Protocols: BSC-Type Features: Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repea

Request, Flow Control Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,050 Date First installed: 1978 Number installed to Date: 10,000 -50,000

BLACK BOX CATALOG/EXPANDOR, INC. DATA CONCENTRATOR 4 Multiplexer Cless: Statistical Input Interface: RS-232C, DCE Maximum Input Channels:

Synchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 9,600 bps Aggregate Transmission Rate: 384 bps

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,800 bps; Asynchronous/Synchronous - As per Modem Speed Communications Protocols: BSC-

Type
Features: Data Compression,
Downline Loading (On-Line
Reconfiguration), Automatic Repeat
Request, Flow Control, Tact
Dlagnostic Features: Remote, Local
Distribution Method: End user
Price: \$1,400

Number installed to Date: 10,000 - 50,000

BLACK BOX CATALOG/EXPANDOR, INC. DATA CONCENTRATOR 4HP Multiplexer Class: Statistical input Interface: RS-232C, DCE Maximum Input Chennels:

Synchronous: 4 Transmission Mode: Fuli-Duplex Input Transmission Rates: Asynchronous - 110 bps to 9,600 bps Aggregate Transmission Rate: 384 bos

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,800 bps, Asynchronous/Synchronous - As per Modem Speed Communications Protocols: BSC-

Type Features: Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control, Terminal-Activated Communications Test Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1.400 Date First Installed: 1978 Number Installed to Date: 10,000 -

BLACK BOX CATALOG/EXPANDOH, INC. DATA CONCENTRATOR & Multiplexer Cless: Statistical Input Interface: RS-232C, DSC Maximum Input Channels:

Synchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 3,600 bps Aggregate Transmission Rate: 768 bps Maximum Output Lines:

Synchronous: 1
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps, 1,800
bps, 8,600 bps;
Asynchronous/Synchronous - As per
Modem Speed
Communications Protocols: BSCType

Type
Pestures: Data Compression,
Downina Loading (On-Line
Reconfiguration), Automatic Repeat
Request, Flow Control, TerminalActivated Communications Flow
Diagnostic Features: Remote, Local
Price: \$2,200
Date First Installed: 1978
Number Installed to Date: 10,000 -

BLACK BOX CATALOG/EXPANDOR, INC. DATA CONCENTRATOR 8HP Multiplexer Class: Statistical

# Multiplexers

Input Interface: RS-232C, DSC Maximum Input Channels:

Synchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps to 9,600 bas

Aggregate Transmission Rate: 768 bas

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 **Output Transmission Mode: Full-**

Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,600 bps; Asynchronous/Synchronous - As per

Modern Speed Communications Protocols: BSC-

Type Features: Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control and Terminal **Activated Communications Test** Diagnostic Features: Remote, Local Distribution Method: End user Price: \$2,200 Date First Installed: 1978 Number installed to Date: 10,000 -50.000

BLACK BOX CATALOG/EXPANDOR, INC. GENERAL PURPOSE DATA CONCENTRATOR **Multiplexer Class: Statistical** Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Tran mission Mode: Half-Duplex, **Full-Dunlex** Input Transmission Rates: Asynchronous - 300 bps, 600 bps, 1,200 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 384

hans Maximum Output Lines: Synchronous: 1 Asynchronous: 1 **Output Transmission Mode: Half-**Duplex Full-Duplex

**Output Line Transmission Rates:** Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 9,600 bps; Synchronous - 2,400 bps, 4,800 bps Communications Protocols: Ascii. EWK/ACK (HP), XON-XOFF Features: Automatic Speed Detection (Autobaud), Data Compression, Automatic Repeat Request, Port Contention, Operational and Statistical Reports, Flow Control, Statistical Convention Multiplexer Diagnostic Features: Remote, Local

Distribution Method: End user Price: \$1,050 to \$2,200 Date First Installed: August 1982 Number Installed to Date: 100 - 500

BLACK BOX CATALOG/EXPANDOR, INC. ASYNCHRONOUS CHANNEL SPLITTER **Multiplexor Class: TDM** 

Input Interface: RS-232C Maximum Input Channels: Synchronous: 2

Asynchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Maximum Output Lines: Synchronous: 1 Output Transmission Mode: Full-Duplex

**Output Line Transmission Rates:** Asynchronous - Up to 38,400 bps Features: Automatic Speed Detection (Autobaud), Data Compression, Automatic Repeat Request, Port Contention, Operational and Statistical Reports, Flow Control Diagnostic Features: Remote, Local

Distribution Method: End user Price: \$635 Date First Installed: August 1982 Number Installed to Date: 100 - 500

CATALOG/EXPANDOR, INC. SYNCHRONOUS CHANNEL SPLITTER (SCS-4) Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Asynchronous: 4 Transmission Mode: Full-Duplex **Input Transmission Rates** Synchronous - 4,800 bps Aggregate Transmission Rate: 380

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Half-**Duplex, Full-Duplex **Output Line Transmission Rates:** Asynchronous/Synchronous - Up to 19,200 bps

Features: Automatic Speed Detection (Autobaud), Data Compression, Automatic Repeat Request, Port Contention, Operational and Statistical Reports. Flow Control Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1.150 Date First Installed: August 1982

Number Installed to Date: Under BO-SHERREL CO., INC.

MX-1 Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Synchronous: 8 Transmission Mode: Full-Duplex **Input Transmission Rates:** Asynchronous - 9,600 bps Aggregate Transmission Rate: 768

Maximum Output Lines: Synchronous: 8 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Asynchronous - 9,600 bps Communications Protocols: All (Transparent)

Diagnostic Features: Local Distribution Method: End user Price: \$495 Date First Installed: December 1983 Number Installed to Date: Under 100 (See Vendor Profile Page V-4)

CANOGA DATA SYSTEMS

CMX-320 Multiplexer Class: Fiber-Optic Input Interface: RS-232C Maximum Input Channels: Synchronous: 32

Transmission Mode: Half-Duplex Full-Duplex input Transmission Rates: Asynchronous - 19,200 bps Aggregate Transmission Rate: 6,144 bps

Maximum Output Lines: Synchronous: 32 Asynchronous: 32 Output Transmission Mode: Half-Duplex, Full-Duplex

Output Line Transm Asynchronous - 14,400 bps Communications Protocols: Bit TDM Features: Automatic Speed

Detection (Autobaud), Continual Monitoring Diagnostic Features: Local Distribution Method: End user Price: \$2,500 Date First Installed: November 1981

Number installed to Date: 100 - 500 (See Vendor Profile Page V-5)

CANOGA DATA SYSTEMS CMX-808 lexer Class: Fiber-Optic Input Interface: RS-232C Maximum Input Channels:

Synchronous: 16 Asynchronous: 8 Transmission Mode: Full-Duplex input Transmission Rates: Synchronous - 9,600 bps; Asynchronous - 19,200 bps Aggregate Transmission Rata: 1,536 bps Maximum Output Lines:

Synchronous: 8 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Asynchronous - 14,400 bps MGT

Features: Automatic Speed Detection (Autobaud), Continual Monitoring Diagnostic Features: Local Distribution Method: End user Price: \$1,200 Date First Installed: November 1982

mber installed to Date: 100 - 500

CANOGA DATA SYSTEMS CMX-816

Multiplexer Class: Fiber-Optic Input Interface: RS-232C, RS-422, V 35 Maximum Input Channels:

Synchronous: 16 Asynchronous: 16 Transmission Mode: Full-Duplex **Input Transmission Rates:** 

Asynchronous - 19,200 bps; Asynchronous/Synchronous - 76.8K Aggregate Transmission Rate: 10

Maximum Output Lines:

Synchronous: 16

Asynchronous: 16 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Asynchronous - 14,400 bps; Asynchronous/Synchronous - 64K

bps Communications Protocols: Bit TDM Features: Automatic Speed

Detection (Autobaud). Programmable, Continual Monitoring Diagnostic Features: Local Price: \$2,750 **Date First Installed: September** 1983

Number Installed to Date: Under

CANOGA DATA SYSTEMS CMX-832 Multiplexer Class: Fiber-Optic TDM Input Interface: RS-232C

Maximum Input Channels: Synchronous: 32 Asynchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 19,200 bps

Aggregate Transmission Rate: 61 bps **Maximum Output Lines:** 

Synchronous: 32 Asynchronous: 32 Output Transmission Mode: Full-**Output Line Transmission Rates:** Asynchronous/Synchronous - 14,400

bps

TDM Features: Automatic Speed Detection (Autobaud), Continual Monitoring Diagnostic Features: Local Distribution Method: End user Price: \$2,700 to \$8,700 Date First Installed: November 1980 Number Installed to Date: 500 -1,000

CERMETEK MICROELECTRONICS MUX-MATE 840 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 2 mission Mode: Full-Duplex Input Transmission Rates Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps Aggregate Transmission Rate: 24 Maximum Output Lines:

Synchronous: 1 Output Transmission Mode: Full-**Output Line Transmission Rates:** Asynchronous - 2,400 bos

Communications Protocola: HDLC (CCITT X.205 Level 2) Peatures: Automatic Repeat Request, Port Contention, Flow Control, Programmable Diagnostic Features: Local Distribution Method: End user; Third-party Price: \$695

(See Vendor Profile Page V-5)

TELECOMMUNICATIONS TURBO MUX 2 Multiplexer Cleas: Statistical Input Interface: RS-232C Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 2,400 bps Aggregate Transmission Rate: 48 bps

Maximum Output Lines: Synchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Asynchronous - 1,200 bps Communications Protocols: Asynchronous - Protocol Features: Data Compression. Automatic Repeat Request, Flow Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$995 Date First Installed: April 1983 (See Vendor Profile Page V-5)

COASTCOM
D/I MUX
Multiplexer Class: Wideband (T-1)

Input Interface: RS-232C, RS-422, RS-449, CCITT V.35 Maximum Input Channels: Synchronous: 16,800 bpa

Synchronous: 16,800 bpa Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 800 bps Aggregate Transmission Rate: 154 bps Maximum Output Lines:

Synchronous: 168
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 800 bps
Communications Protocols: DS1
Features: Protocol Conversion,
Programmable, Network Monitor
Disgnostic Features: No
Distribution Method: End user,
OEM, Third-party
Price: \$6,000
Date First Installed: May 1982
Number Installed: May 1982
Number Installed to Date: 100 - 500
(See Vendor Profile Page V-7016)

CODEX CORP. 670 MULTIDROP STATISTICAL MULTIPLEXORS Multiplexor Class: Statistical input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 16 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 2,400 bps, 4,800 bps Aggregate Transmission Rate: 384 bps Maximum Output Lines: Other: Multidrop Line Output Transmission Mode: Full. Duplex **Output Line Transmission Rates:** Asynchronous/Synchronous - 1,200 bps, 2,400 bps; Synchronous - 1,800 bps, 4,800 bps, 9,600 bps; Asynchronous - 1,800 Communications Protocols: Ascii, Asynchronous Protocols Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering

600 bps, 1,200 bps, 1,800 bps,

CODEX CORP. 8001 INTELLIGENT NETWORK PROCESSOR Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 24/V 28

Delay, Flow Control, Programmab

Price: \$1,350 to \$5,400

(See Vendor Profile Page V-5)

Diagnostic Features: Remote, Local Distribution Method: End user

Maximum Input Channels: Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Full-Duplex, Echoplex Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 1,405 bps, 600 bps, 9,600 bps, 1,45 Kb ps, 150K bps, 200K bps Aggregate Transmission Rate: 768

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps,

19.200 bps
Communications Protocols: Ascii,
Most Asynchronous Protocols
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request, Flyback
Buffering Delsy, Flow Control,
Programmable, Satellite Link
Support

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,500 to \$4,925 Date First Installed: 1981

CODEX CORP. 6005 INTELLIGENT NETWORK

PROCESSOR
Multiplexer Class: Statistical
input Interface: RS-232C, CCITT
V.24/V.28
Maximum Input Channels:

Synchronous: 16
Asynchronous: 16
Transmission Mode: Half-Duplex,
Füll-Duplex, Echoplex
Input Transmission Rates:
Asynchronous/Synchronous - 50
bps, 75 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,800 bps, 2,400

bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 14,400 bps, 19,200 bps, 134.5K bps, 150K bps, 200K bps

Aggregate Transmission Rate: 1,536 bps Maximum Output Lines: Asynchronous: 1

Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps

Communications Protocola: HDLC (CCITT X.20 Lavel 2), SDLC, BSC, Ascii, Many Synchronous Protocol Pestures: Automatic Speed Detection (Autobaud), Downline Losding (On-Line Reconfiguration), Automatic Repeat Request, Fyback Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Satellite Capabilities Standard

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$2,600 to \$7,000 Date First Installed: 1982

CODEX CORP. 6010 INTELLIGENT NETWORK PROCESSOR Multiplexer Class: Statistical

Multiplexer Class: Statistical input Interface: RS-232C Maximum Input Channels: Synchronous: 30 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Ratios: Asynchronous - 75 bpe, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps 4,800 bps Aggregate Transmission Ratis: 19

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps

Communications Protocols: CCITT x25 (Lavel) 25 (Lavel) 27 Feetures: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Network Monitor, Configurable Diagnostic Feetures: Renote, Loal Diagnostic Feetures: Renote, Loal Diagnostic Feetures: Renote, Loal Diagnostic Pressures: Renote, Loal Diagnostic Pressures: Renote, Loal

Date First Installed: 1979

CODEX CORP.
6030 INTELLIGENT NETWORK
PROCESSOR

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28, MIL 188C, Current Loop Maximum Input Channels: Synchronous: 128

Asynchronous: 128
Transmission Mode: Half-Duplex,
Full-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,

1,800 bps; Asynchronous/Synchronous - 2,400 bps, 3,600 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 576

bps Maximum Output Lines: Asynchronous: 1

Output Transmission Mode: Full-**Output Line Transmission Rates** Synchronous - 1,200 bos. 1,800 bos. 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps ications Protocols: HDLC (CCITT X.205 Level 2), SDLC, BSC, Ascii, Many Synchronous Protocols Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration). Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$8,500 Date First Installed: 1977

CODEX CORP. 8040 INTELLIGENT NETWORK PROCESSOR

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28, MIL 188C, Current Loop Maximum Input Channels:

Synchronous: 140
Asynchronous: 140
Transmission Mode: Half-Duplex,
Full-Duplex, Echoplex,
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 900 bps, 1,200 bps,
1,800 bps;
Asynchronous/Synchronous - 2,400
bps, 3,600 bps,
4,800 bps, 7,200
bps, 9,600 bps
Aggregate Transmission Rate: 576

bos Maximum Output Lines: Asynchronous: 16 Output Transmission Mode: Full-Duolex Output Line Transmission Rate Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, BSC, Ascii, Many Synchronous Protocols Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Network Monitor, Multiple Protocols Diagnostic Features: Remote, Local Distribution Method: End user

CODEX CORP. 8050 DISTRIBUTED COMMUNICATIONS PROCESSOR Multiplexer Class: Statistical

Price: \$17,000

Input Interface: RS-232C Asynchronous: 120 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex

Input Trensmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, Asynchronous - 300 bps, 600 bps, 1,200 bps

Aggregate Transmission Rate: 5,760 bps Maximum Output Lines:

Asynchronous: 89 Output Transmission Mode: Full-Duplex

Output Line Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps:

Asynchronous/Synchronous - 7, 200 bps, 64,000 bps, 64,

Diagnostic Features: Remote, Local Price: \$45,000 Date First Installed: 1981

CODEX CORP. 804-505 SYNCHRONOUS MULTIPLEXORS Multiplexor Class: TDM Input Interface: RS-232C, CCITT

Maximum Input Chennels: Asynchronous: 4 Transmission Mode: Half-Duplex,

Full-Duplex Input Transmission Retes: Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 192

bps
Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: Full-

Duplex Output Line Trensmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 1,400 bps, 19,200 bps, Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT X.25 Level 3), BSC, All Synchronous

Protocols
Features: Downline Loading (OnLine Reconfiguration)
Diagnostic Features: Remote, Local
Distribution Method: End user

Distribution Method: End us Price: \$1,650 to \$2,250 Date First Installed: 1979

CODEX CORP. 980 SYNCHRONOUS MULTIPLEXOR Multiplexer Class: TDM Input Interface: Mil. 188C Maximum Input Channels:

Asynchronous: 4
Transmission Moder Full-Duplex
Input Transmission Rates:
Synchronous - 300 bps, 600 bps,
1,200 bps, 1,800 bps, 2,400 bps,
4,800 bps, 7,200 bps, 9,600 bps,
Asynchronous/Synchronous - 150
bps, 7,200 bps
Aggregate Transmission Rate: 960

Maximum Output Lines: Asynchronous: 1

Augustation Mode: Full-Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps; Asynchronous/Synchronous - 600 bps, 7,200 bps, 7,200 bps, 7,200 bps Communications Protocols: HDLC CCITT X,205 Level 2); SDLC, CCITT

X.25 (Level 3), BSC, All Synchronous Protocols Features: Downline Loading (On-Line Reconfiguration), LED Indications, Configurable Diagnostic Features: Remote, Local Distribution Method: End user

Price: \$4;500 Date First installed: 1980

CODEX CORP.
B000 GROUP BAND MULTIPLEXOR
Multiplexer Class: TDM
Input Interface: RS-232C, CCITT
V.24/V.28
Maximum Input Channels:

Asynchronous - 20 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Synchronous - 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 640

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 4,800 bps, 56,000 bps; Asynchronous/Synchronous -50,000 bps, 64,000 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT X.25 (Level 3), BSC, All Synchronous

Protocols
Features: Configurable, LED
Indicators
Diagnostic Features: Remote, Local
Distribution Method: End user

Price: \$5,000 Date First Installed: 1974

COMERENT
COMMUNICATIONS SYSTEMS
CORP.
FSM-76
Multiplexer Class: FDM

Input Interface: CCITT V.24/V.28, Optional Office Telex Maximum Input Channels:

Synchronous: 38 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110

bps, 150 bps, 200 bps, 225 bps, 300 bps, 600 bps Aggregate Transmission Rate: 228

Maximum Output Lines:

Synchronous: 38
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110

Asynchronous - 30 ops., 75 ops., 190 pbs., 150 bps., 150 bps., 200 bps., 2400 bps. Communications Protocols: Ascil Feetures: Programmable, Voicegrade Circuit Use
Disgnostic Features: Local
Distribution Method: End user
Price: \$7,200 to \$11,400
Date First Installed: 1978
Number Installed: 1978
Number Installed: 0 Date: 10,000 - 50,000

(See Vendor Profile Page V-5)

COMPREHENT COMMUNICATIONS SYSTEMS CORP.

LINEMATE 192
Multiplexer Class: FDM
Input Interface: RS-232C
Transmission Mode: Full-Duplex
Input Transmission Rates:
Synchronous - 2,400 bps, 3,600 bps,
4,800 bps, 7,200 bps, 9,500 bps,
19,200 bps;

Asynchronous/Synchronous - 19,200 bps Aggregate Transmission Rate: 192

bps Maximum Output Lines: Synchronous: 1

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 14,400

bps Features: Simultaneous Voice/Data, 0/2 Wire Twisted Pair Diagnostic Features: Local Distribution Method: End user, OEM Price: \$500

Date First Installed: April 1982 Number Installed to Date: 100 - 500

COMMUNICATIONS SYSTEMS CORP.

SPM-94A Multiplexer Class: FDM Input Interface: RS-232C Maximum Input Chennels: Synchronous: 1

Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 300 bps Aggregate Transmission Rate: 3

Maximum Output Lines: Synchronous: 2 Output Transmission Mode: Half-Duplex, Full-Duplex Output Line Transmission Rates: Asynchronous: 300 bps Communications Protocols: Any Features: Simultaneous Voice/Data, Dial-up Network Diagnostic Features: Local Distribution Method: End user, OEM. Third-party

Price: \$475 Date First Installed: July 1983 Number Installed to Date: Under

COMDESIGN, INC.

TC-500 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT

Maximum Input Channels: Synchronous: 32 Asynchronous: 32

Asynchronous: 32 Transmission Mode: Full-Duplex, Echoplex Input Transmission Rates: Asynchronous/Synchronous - 9,600 bos

Aggregate Transmission Rate: 3,072 bps

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-Duplex, Echoplex Output Line Transmission Rates: Asynchronous/Synchronous - 14,400 bps Communications Protocols: User

Communications Protocols: User Selectable Peatures: Automatic Speed Detection, Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, Front Panel Security Diagnostic Features: Remote

Diagnostic Features: Remote Distribution Method: End user, Third-perty Price: \$1,700 to \$7,800 Date First Installed: February 1982 Number Installed to Date: 100 - 500

(See Vendor Profile Page V-6)

COMMUNICATION DEVICES,

IHC. 01-09-0075 Multiplexer Class: Statistical input Interface: RS-232C Maximum Input Channels:

Asynchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 1,200 bps Aggregate Transmission Rate: 96 bps

Maximum Output Lines: Asynchronous: 8 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention. Flow Control Diagnostic Features: No Distribution Method: End user Price: \$2,000 Date First Installed: 1976 Number Installed to Date: Under 100

(See Vendor Profile Page V-6)

COMPLEX SYSTEMS, INC. AMUX 4/8

Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 9

Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Aggregate Transmission Rate: 384 bos

Output Transmission Mode: Half-Duplex, Full-Duplex **Output Line Transmission Rates:** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: Complex X.25 (DERT X.25) Features: Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Flow Control, Programmable, Menu-Driven Setup Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,350 to \$1,950 Number Installed to Date: Under

# (See Vendor Profile Page V-6) COMPRE COMMUNICATIONS,

BILINK 2AA24 Multiplexer Class: Statistical Input Interface: RS-232C Transmission Moder Full-Duplex Input Transmission Rates: Asynchronous - 2,400 bps Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Synchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 2,400 bps
Communications Protocols:
Proprietary
Features: Protocol Conversion,

Automatic Repeat Request, Flow Control, Programmable, Network Monitor, Automatic Passthrough Diagnostic Features: Remote, Local Distribution Method: End user, OEM. Third-party Price: \$675 Date First Installed: October 1982 Number Installed: 10 Date: 500 -

1,000 (See Vendor Profile Page V-6)

COMPRE COMMUNICATIONS, INC.
BILINK 2AS192
Multiplexer Class: Statistical input Interface: RS-232C
Transmission Mode: Full-Duplex Input Transmission Rates:
Synchronous - 9,600 bps
Aggregate Transmission Rate: 192 bps
Maximum Output Lines:

Asynchronous: 1
Output Line Transmission Retes:
Synchronous - 2,400 bps
Communications Protocols:
Proprietary
Features: Protocol Conversion,
Automatic Repeat Request, Flow
Control, Programmable, Network
Monitor, Automatic Passifracion,
Diesgnostic Features: Remote, Local
Diestibustion Method: End user,
OEM, Third-party
Price: \$675
Date First Installed: October 1982
Number Installed: 00 Date: 500 -

COMPRE COMMUNICATIONS, INC.

DATA XCHANGE
Multiplexer Class: Statistical
Input Interface: RS-232C
Maximum Input Channels:

Synchronous: 1

Synchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 9,600 bps Aggregate Transmission Rate: 3,072 bps Maximum Output Lines:

Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous/Synchronous - 14,400

Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, Field Expandable, Upgradable Diagnostic Features: Remote, Load Distribution Method: End user, OEM, Third-party Price: 82,550 to 59,800 Date First Installed: June 1981 Number Installed: June 1981 Number Installed to Date: 500 - 1000

COMPRE COMMUNICATIONS,

ECONO SERIES 4
Multiplexer Class: Statistical
Input Interface: RS-232C
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 300 bps, 1,200 bps,
2,400 bps, 4,800 bps
Aggregate Transmission Rate: 192
bps
Maximum Output Lines:

Synchronous: 1
Asynchronous: 1
Cutput Transmission Mode: FullUplex
Output Line Transmission Rates:
Asynchronous - 4,800 bps;
Synchronous - 9,800 bps;
Synchronous - 9,800 bps;
Features: Automatic Repeat
Request, Fully Confriot,
Programmable
Diagnostic Features: Local
Distribution Method: End user,
OEM, Third-party

Price: \$1 095

Date First Installed: January 1981 Number Installed to Date: 100 - 500

COMPRE COMMUNICATIONS,

ECONO SERIES 8
Multiplexer Cleas: Statistical
Input Interface: RS-232C
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 300 bps, 1,200 bps,
2,400 bps, 4,800 bps
Aggregate Transmission Rate: 384
bps

Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Retes:
Asynchronous - 9,600 tps
Features: Automatic Repeat
Request, Operational and Statistical
Reports, Flow Control
Diagnostic Features: Local
Distribution Method: End user,
OEM, Third-party
Price: \$1,692
Date First Installed: January 1981
Number Installed to Date: 100 - 500

COMPRE COMMUNICATIONS,

INC,
O-LINK 4AA24
Multiplexer Class: Statistical Input Interface: RS-232C
Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous - 2,400 bps
Aggregate Transmission Rate: 96 bps
Maximum Output Lines:

Synchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Retea:
Asynchronous - 9,600 bps
Peatures: Downline Loading (OnLine Reconfiguration), Automatic
Repeat Request, Operational and
Statistical Reports, Flow Control,
Programmable, Network Monitor,
Automatic Passibrough
Diagnostic Features: Remote, Local
Distribution Method: End user,
OEM, Third-party
Price: \$1,195
Date First Installed: February 1983
Number installed to Date: 100 - 500

COMPRE COMMUNICATIONS,

Q-LINK 4AS192

Multiplexer Class: Statistical Input Interface: RS-232C Input Transmission Rates: Synchronous - 4,800 bps; Synchronous - 9,600 bps Aggregate Transmission Rate: 24 bps Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Output Trans

Output Transmission Mode: Full-Duplex Cutput Line Transmission Rates: Asynchronous - 9,600 bps Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, Automatic Passithrough Diagnostic Restures: Remote, Local Distribution Method: End user, OEM, Third-party Price: \$1,195 Date First Installed: February 1983 Number Installed to Date: 100 - 500

COMPUTER
COMMUNICATIONS
SPECIALISTS, INC.
CHANNEL COMMUNICATIONS
CONCENTRATOR (CCC)
Multiplexer Class: TDM
Input Interface: Proprietary
Maximum Input Channols:

Maximum Input Channels: Synchronous: 64 Transmission Mode: Half-Duplex Input Transmission Rates: Asynchronous - 9,600 bps Maximum Output Lines: Synchronous: 3

Synchronous: 3 Output Transmission Mode: Half-Duplex Output Line Transmission Rates: Asynchronous: 9,800 bps Features: Downline Loading (On-Line Reconfiguration), Automatic Repeal Request, Port Contention, Switching, Flow Control, Network Monitor

Monitor
Diagnostic Features: Local
Distribution Method: End user
Price: \$3,695
Date First Installed: February 1982.
Number Installed to Date: Under
100
(See Vendor Profile Page V-6)

COMPUTER IDENTICS CORP.

RAMM-16 Multiplexer Class: Statistical Input Interface: RS-232C, 20 MA Current Loop Maximum Input Channels:

Maximum Input Channelli: Synchronous: 16 Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 96 bps

Maximum Output Lines: Synchronous: 1 Output Transmission Mode: Half-Duplex Output Line Transmission Rates: Asynchronous - 2,400 bps, 4,800

bps, 9,600 bps, 14,400 bps, 56,000 bps Communications Protocols: SDLC, BSC, Ascil Features: Protocol Conversion, Polling, Port Contention Diagnostic Features: Local Distribution Method: Third-party Price: \$4,000 Date First Installed: June 1978 Number Installed: Date: Under

COMPUTER IDENTICS CORP. TAMM-16A Multiplexer Class: Statistical Input Interface: RS-232C, 20MA Current Loop

(See Vendor Profile Page V-7)

# Multiplexers

Maximum Input Channels: Synchronous: 16 Transmission Mode: Half-Duplex Transmission Mate: 1 Asynchronous 110 bps. 300 bps. 600 bps. 1,200 bps. 4,800 bps. 9,600 bps Aggregate Transmission Rate: 96 bps Maximum Output Lines:

Maximum Output Lines: Synchronous: 1 Output Transmission Mode: Half-Duplex

Output Line Transmission Rates: Asynchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 56,000 bps Communications Protocols: SDLC.

BSC, Ascil Features: Protocol Conversion, Polling, Port Contention Diagnostic Features: Local Distribution Method: Third-party Price: \$5,000

Date First Installed: February 1978 Number Installed to Date: Under 100

COMPUTER INQUIRY SYSTEMS, INC. CIS BMUX Multipleyer Class: TDM

Input Interface: RS-232C Maximum Input Channels: Synchronous: 48 Transmission Mode: Full-Duplex Input Transmission Rates:

Transmission Mode: Full-Duplex input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Maximum Output Lines: Asynchronous: 1

Output Transmission Mode: Full-Duplex Communications Protocols: Ascii Features: Protocol Conversion, (On-Line Reconfiguration), Flybox Buffering Delay, Poling, Port Contention, Flow Control Diegnostic Features: Remote, Local

Distribution Method: End user Price: \$300 Date First installed: 1980 Number Installed to Date: 100 - 500

(See Vendor Profile Page V-7)

GOMPUTER PERIPHERAL

EVSTEMS, INC.

MARS SYSTEM
MUX/CONCENTRATOR
Multiplexer Class: Statistical
Input Interface: RS-232C
Maximum Input Channels:
Synchronous: 8

Asynchronous: 8
Asynchronous: 8
Transmission Node: Half-Duplex Imput Transmission Rates:
Asynchronous/Synchronous: 50
bps, 75 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,800 bps, 2,400
bps, 3,600 bps, 4,800 bps, 7,200
bps, 9,600 bps, 19,200 bps
Aggregate Transmission Rate: 192
bps

Maximum Output Lines: Synchronous: 8 Asynchronous: 4 Output Transmission Mode: Half-Dunlex Output Line Transmission Rates: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps

Features: Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Suffering Delay, Polling, Prot Contention, Switching, Flow Control, Programmable, Burrough-Criented Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,500 to \$5,000 Date First Installed: July 1982. Number Installed to Date: Under

100 (See Vendor Profile Page V-7)

#### COMPUTER SYSTEMS

CS/88
Multiplexer Class: Concentrator Input Interface: RS-232C, RS-422, CCITT V.24/V.28
Maximum Input Channels:

Synchronous: 16
Asynchronous: 8
Transmission Mode: Half-Duplex,
Fulf-Duplex
Input Transmission Rates:
Asynchronous - 110 bps, 300 bps,
1,200 bps; Asynchronous/
Synchronous - 2,400 bps;
Synchronous - 4,800 bps, 9,600 bps

19,200 bps Aggregate Transmission Rate: 1 bos

Maximum Output Lines: Synchronous: 2 Asynchronous: 2 Output Transmission Mode: Half-

Duplex, Full-Duplex Output Line Transmission Rates: Asynchronous/Synchronous - 2,400 bps, 4,800 bps, 9,600 bps; Synchronous - 14,400 bps, 56,000 bps.

Communications Protocols: SDLC, BSC, Assi, Custom Protocols BSC, Assi, Custom Protocols Features: Automatic Speed Detection (Autobaud), Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Poling, Port Contention, Switching, Programmable Disgnostic Features: Local Distribution Method: End user, OEM Price: \$15.00 to \$3.000

COMPUTROL
MEGA PLEX
Multiplexer Class: Statistical
Input Interface: RS-232C, RS-422,

Date First Installed: 1983 (See Vendor Profile Page V-7)

Maximum input Channels: Synchronous: 64 Asynchronous: 64 Transmission Mode: Half-Duplex, Full-Duplex input Transmission Rates:

Asynchronous - 2,400 bps, 9,600 bps Aggregate Transmission Rate: 3,072 bps Maximum Output Lines: Asynchronous: 1
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 1M
bps
Communications Protocols: HDLC
(CCITT X.205 Level 2)

Peatures: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Flow Control, Programmable, Network Monitor Diagnostic Features: Local Distribution Method: End user, OEM Price: \$5,000 to \$10,180 Date First Installed: June 1981 (See Vendor Profile Page V-7)

DATABIT, INC.
MODEL 925 TELEX & DATA TOM
Multiplexer Class: TDM
input Interface: CCITT R.101
Maximum Input Channels:
Synchronous: 92

Asynchronous: 92

Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps; Synchronous - 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 560

bps
Features: Programmable
Diagnostic Features: Local
Distribution Method: End user
(See Vendor Profile Page V-9)

DATAGRAM CORP. DM 900

Multiplexer Class: Statistical Input Interface: RS-232C, 20 mA Current Loop, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 9
Asynchronous: 1
Transmission Mode: Half-Duplex, Full-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 110 bps, 300 bps, 400 bps, 1200 bps, 1800 pps, 800 bps, 9,600 bps, 4,000 bps, 7200 bps, 9,600 bps
Aggregate Transmission Rate: 864 bps
Maximum Output Lines:

Asynchronous: 1 Duptox Transmission Mode: Full-Duptox Output Line Transmission Rates: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 14,400 bps

Synchronous: 1

Communications Protocole: HDLC (CCITT x.205 Ever 2), Asci Speed Detection (Autonautic Speed Detection (Autonautic Speed Detection (Autonautic Deta Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Flow Control, Operational and Statistical Reports, Programmable, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: End user, Third-party Price: \$1,550 to \$2,750 Date First Installed: June 1982 Number Installed to Date: 500 -1,000

(See Vendor Profile Page V-9)

DATAGRAM CORP.

DM 1600 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 16
Asynchronous: 4
Transmission Mode: Half-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 7,200 bps, 9,600 bps
Aggregate Transmission Rate:

9,600 bps
Meximum Output Linea:
Synchronous: 1
Asynchronous: 1
Output Line Transmission Rates:
Asynchronous/Synchronous - 1,20

Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: HDLC

(CCITT X.205 Level 2), Asci Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user, Third-party

Price: \$2,200 to \$4,600
Date First Installed: June 1979
Number Installed to Date: 500 -

DATAGRAM CORP.

DM 4800 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28, 20 mA Current Loop Maximum Input Channels:

Synchronous: 52
Aaynchronous: 4
Transmission Mode: half-Duplex,
Falf-Duplex, Echoplex
Input Transmission Retes:
Asynchronous - 110 bps, 300 bps,
600 bps, 1,200 bps, 1,600 bps,
Asynchronous/Synchronous - 2,400
bps, 7,200 bps, 9,600 bps
Aggregate Transmission Rate:
9,600 bps

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Line Transmission Rates: Synchronous-1,200 bps 1,800 bps, 2,400 bps, 4,800 bps 9,800 bps, 14,400 bps, 19,200 bps

Communications Protocols: HDLC (CCITT X.205 Level 2), Ascii Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Flow Control, Programmable, Network Monitor, Operational and Statistical Reports
Diegnostic Features Remote, Local Distribution Method: End user, Third-party
Price: \$3,650 to \$13,250
Date First Installed: June 1980
Number Installed: June 1980
Number Installed: 50 -

DATAPRODUCTS NEW ENGLAND, INC. DP MUX-256 Multiplearer Class: Statistical Input Interface: EIA

Maximum Input Char

Synchronous: 32 Asynchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 110 bps, 1,800 bps, 3,600 bps, 1,800 bps, 3,600 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, Synchronous 150 bps, 8,000 bps, 16,000 bps, 32,000 bps Aggregate Transmission Rates: 2,560 bps

Meximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-

Duplex Output Line Transmission Rates: Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,800 bps, 14,400 bps

Cermunications Protocols: HDLC (CCITT X.205 Level 3), SDLC, CCITT X.25 (Level 3), BSC, Ascil Features: Downline Loading (On-Line Reconfiguration), Operational and Statistical Reports,

Programmable
Diagnostic Features: Local
Distribution Method: End user
Price: \$4,842 to \$9,550
Date First Installed: 1983
Number Installed to Date: Under

(See Vendor Profile Page V-9)

DATAPRODUCTS NEW

MC 3 Multiplexer Class: Statistical Input Interface: EIA Maximum Input Channels: Synchronous: 32

ENGLAND, INC.

Asynchronous: 32
Transmission Modes: tull-Duplex Imput Transmission Rates: Asynchronous -75 bps, 110 bps; Asynchronous/Synchronous -300 bps, 1,200 bps, 2,400 bps, 4,800 bps; Synchronous -600 bps, 9,600 bps, 19,200 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Cutput Line Transmission Retea:
Asynchronous Synchronous - 1,200
bps, 4,800 bps; Synchronous - 9,600
bps, 14,400 bps; 56,000 bps
Communications Proteoole: HDLC
(CCITT X.205 Level 2), SDLC, CCITT
X.25 (Level 3), BSC, Ascil
Features: Downline Loading (OnLine Reconfiguration), Operational
and Statistical Reports.
Programmable
Diagnostic Features: No
Distribution Method: End user
Price: \$6,715 to \$10,800
Date First Installed: 1980

DCF 5000
Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 4 Transmission Mode: Half-Dupiex, Full-Dupiex, Full-Dupiex,

DATATEL INC.

Asynchronous: 1 Output Transmission Mode: Full-Dunley **Output Line Transmission Rates:** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14 400 hns 19 200 hns Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user, Third-party Price: \$1,300 Date First Installed: 1982 Number Installed to Date: Under

DATATEL, INC.
DCP 9100
Multiplexer Class: TDM
Input Interface: RS-232C, V.35
Maximum input Channels:
Asynchronous: 96
Transmission Mode: Half-Duplex,
Full-Duplex
Input Transmission Bates:

(See Vendor Profile Page V-10)

Transmission Moder Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 15,400 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 1.5M
bps
Communications Protocols: DY/FE
Features: Downline Loading (On-

Line Reconfiguration), Operational and Statistical Reports, Programmable, Network Monitor Diagnostic Features: Remote, Local Price: \$3.850 Date First Installed: February 1983 Number Installed to Date: Under 100

DATEC, INC.
DATEC DATAMIX
Multiplexer Class: Statistical
Input Interface: RS-222c
Maximum Input Channels:
Synchronous: 2
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous: -110 bps, 300 bps,
1,200 bps, 2,400 bps, 4,800 bps,
9,600 bbs

Aggregate Transmission Rate: 192 bps Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-

Duplex Output Line Transmission Rates: Asynchronous - Up to 9,600 Communications Protocots: SDLC Subset

Features: Automatic Speed Detection (Autobaud), Data Compression, Automatic Repeat Request, Polling, Flow Control, Programmable, End to End Speed Conversion Diagnostic Features: Remote, Local Distribution Method: Third-party

Price: \$835
Date First Installed: 1983
Number Installed to Date: Under

100 (See Vendor Profile Page V-10)

DCA/TAC AYARWM 205 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 128
Transmission Mode: Full-Duplex,
Echoplex
Input Transmission Rates:

Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 12 bps
Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 1 200 hos 1 800 ho

Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: Ascii, DDCMP Features: Automatic Speed

Detection (Autobaud), Data

Compression, Automatic Repeat Request, Flyback Buffering Delay, Polling, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$4.250 to \$6,000 Date First installed: 1979 Number installed to Date: Under 100 (See Vendor Profile Page V-10)

DCA/TAC SYSTEM 105 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 24/V 28

Maximum Input Channelis: Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous: 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96 bps Maximum Cuttast Lines:

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,000 bps Communications Protocols: DICCAMP

DDCMP
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Downline Loading
(On-Line Reconfiguration), Automatic
Repeat Request, Flyback Buffering
Delay, Operational and Statistical
Reports, Flow Comford,
Programmable, Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user, OEM
Price: \$1,295 to \$2,650
Data First Installed: 1980
Number Installed: 1980
Number Installed: 1004

DCA/TAC SYSTEM 110 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8
Transmission Mode-Hall-Duplex, Folil-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,900 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,000 bps
Aggregate Transmission Rate: 576 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: DDCMP

Documer Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Suffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local

ation Method: End user, OEM Price: \$1,495 to \$2,850 Date First Installed: 1982 Number Installed to Date: Under

DESITAC SYSTEM 120

Multiplexer Clees: Statistical Input Interface: RS-232C, CCITT V 24/V 28

Maximum Input Channels: Synchronous: 32 smission Mode: Half-Duplex, Full-Duplex, Echoplex

Input Transmission Rates Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 576

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex **Output Line Transmission Rate** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: Ascii Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user,

Third-party Price: \$2,450 to \$8,595 Date First installed: 1982 Number installed to Date: Under 100

DCA/TAC SYSTEM 195

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 24/V 28 Maximum Input Channels:

Synchronous: 32 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 576

**Maximum Output Lines:** Asynchronous: 1

**Output Transmission Mode: Full-**Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps,

14,400 bps, 19,200 bps Communications Protocols: Ascii

Features: Automatic Speed Detection (Autobaud) Data Compression Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Polling, Operational and Statistical Reports, Flow Control,

Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,250 to \$9,395 Date First Installed: 1982 Number Installed to Date: Under 100

SYSTEM 325 NETSWITCH Multiplexer Class: Statistics Input Interface: RS-232C, CCITT V.24/V.28

**Maximum Input Channels:** Synchronous: 1,472 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Maximum Output Lines:

Output Transmission Mode: Full-Output Line Trans mission Rates Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: Ascii.

Asynchronous: 11

Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports. Flow Control, Programmable, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: Fod user Price: \$12.560 Date First Installed: January 1982 Number installed to Date: Under

SYSTEM 335 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT

Maximum Input Channels: Synchronous: 42 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps

Maximum Output Lines: Asynchronous: 4 **Output Transmission Mode: Full-**

Duplex **Output Line Transmission Rates** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps Communications Protocols: CCITT X.25 (Level 3), BSC, Ascii, DDCMF Features: Automatic Speed Detection (Autobaud), Data Compression Protocol Conversion Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay Polling, Port Contention, Switching,

Operational and Statistical Reports, Flow Control, Programmable. Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user, OEM Price: \$6.795 to \$7.195 Date First Installed: 1983 Number Installed to Date: Under

DCA/TAC SYSTEM 355 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 24/V 28

Maximum Input Channels: Synchronous: 1,400 Transmission Mode: Half-Duplex. Full-Dunley Echonies Input Transmission Rates: 50 bps, 75 bps, 110 bps, 300 bps, 600 bps. 1,200 bps, 1,800 bps, 2,400 bps, 3.600 bos. 4.800 bos. 7.200 bos. 9 600 bps **Maximum Output Lines:** 

Asynchronous: 44 Output Transmission Mode: Full-Duplex **Output Line Transmission Rat** Synchronous - 1,200 bps, 1,800 bps, 2 400 has 4 800 has 9 600 has 14,400 bps, 19,200 bps X.25 (Level 3), BSC, Ascii, DDCMP Features: Automatic Speed Detection (Autobaud), Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Polling, Port Contention, Switching, Operational and Statistical Reports,

Flow Control, Programmable. Network Monitor Diagnostic Features: Remote, Local ibution Method: End user, OEM Price: \$9.995 to \$11.295 Date First Installed: 1980

DCA/TAC T-1 SPEED TIME DIVISION MULTIPLEXOR **Multiplexer Class: TDM** Input Interface: RS-232C, RS-422. CCITT V 24/V 28 RS-423 V 35 Rell

Synchronous: 128 Asynchronous: 128 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 100 bps, 102 bps, 300 bps, 400 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 20,480 bps **Maximum Output Lines:** 

Asynchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Trans** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous - T-1; Asynchronous/Synchronous - 100 bps, 102 bps, 400 bps

Communications Protocols: HDLC (CCITT X 205 Level 2), SDLC, CCITT X.25 (Level 3), BSC, Ascii. Transparent Features: Downline Loading (On-Line Reconfiguration), Operational, Statistical Reports, Programmable, Bandwidth Contention Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,800 to \$4,950 Date First Installed: December 1983 Number Installed to Date: Under

DEVELCON ELECTRONICS. DS1600

Multiplexer Class: Statistical Input Interface: RS-232C, 20 mA Current Loop Maximum Input Channel

Synchronous: 16 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 9,600 bos Aggregate Transmission Rate: 192 **Maximum Output Lines:** 

Asynchronous: 1 Output Transmission Mode: Full-**Output Line Transmis** Synchronous - 14 400 has (CCITT X.205 Level 2) estures: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Port Contention, Programmable, Burst Aggregate - 76,800 bps Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$2,600 to \$5,000 (See Vendor Profile Page V-10)

DEVELCON ELECTRONICS, DS1800

Multiplexer Clase: Statistical Input Interface: RS-232C, 20 mA Current Loop

Maximum Input Chennels: Synchronous: 9 mission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 9,600 bps Aggregate Transmissi

**Maximum Output Lines:** Asynchronous: 1 **Output Transmission Mode: Full-**Duplex Output Line Transmission Rates: Asynchronous - 14,400 bps Ne HDI C (CCITT X.205 Level 2) Features: Automatic Spe Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Port Contention Programmable Burst Aggregate - 76,800 bps Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,550 to \$2,750

### DEVELOON ELECTRONICS.

D\$4800 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 52 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 9,600 bps Aggregate Transmission Rate: 192 bos

aximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmis on Rates:

Synchronous - 14,400 bos de: HDI C (CCITT X.205 Level 2) Features: Automatic Spi Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Port Contention, Programmable, Burst Aggregate - 76,800 bps Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$3,650 to \$13,250

#### DIGITAL EQUIPMENT CORP. DFM04

Multiplexer Class: Statistical Input Interface: RS-232C, RS-423 ximum Input Chennels:

Synchronous: 4 Asynchronous: 4 Input Transmission Rates: Synchronous - Up to 9,600 bps Aggregate Transmission Rate: 1,536 bps Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Festures: Remote Local Price: \$2,675 Date First Installed: 1983 (See Vendor Profile Page V-10)

#### DIGITAL EQUIPMENT CORP.

Multiplexer Class: Statistical input interface: RS-232C, RS-423 Maximum Input Channels: Synchronous: 8

Asynchronous: 8 Input Transmission Rates: Synchronous - Up to 9,600 bps Aggregate Transi 1,536 bps Feetures: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Disgnostic Features: Remote, Local Price: \$3,350 Date First Installed: 1983

#### DIGITAL EQUIPMENT CORP. DFM12

er Class: Statistical Input Interface: RS-232C, RS-423
Maximum Input Channels:
Synchronous: 12

Asynchronous: 12 Input Transmission Rates Synchronous - Up to 9,600 bps gregate Transmission Rate: Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Remote, Local Price: \$4.075 Date First Installed: 1983

#### DIGITAL EQUIPMENT CORP. DEM16

Multiplexer Class: Statistical Input Interface: RS-232C, RS-423 Maximum Input Channels:

Synchronous: 16 Asynchronous: 16 input Transmission Rate Synchronous - Up to 9,600 bps Aggregate Transmission Rate: 1.536 bos Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Remote, Local

#### DYNATECH PACKET TECHNOLOGY, INC. **DP 1000**

Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

mission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 760

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-

Duplex Output Line Transmission Rate Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps. 14,400 bps, 19,200 bps Communications Protocols: SDLC Features: Automatic Speed Detection (Autobaud), Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Polling, Port Contention, Switching, Flow Control Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,000 to \$2,000 Date First Installed: 1981 (See Vendor Profile Page V-11)

#### DYNATECH PACKET TECHNOLOGY, INC. MULTIPAD 25

Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 64 Trensmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps **Maximum Output Lines:** 

Asynchronous: 2 **Output Transmission Mode: Full-**Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - Up to 64,000 bps cations Protocols: HDLC

(CCITT X.205 Level 2), CCITT X.25 (Level 3) Features: Automatic Speed Detection (Autobaud), Data

Compression, Protocol Conversion. Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Switching, Operational and Statistical Reports, Flow Control. Programmable Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,000 to \$60,000

Date First installed: 1981 DYNATECH PACKET TECHNOLOGY, INC. MULTIPLEX 25

**Multiplexer Class: Statistical** Input Interface: RS-232C Maximum Input Channels:

Synchronous: 64 Transmission Mode: Full-Duplex Input Transmission Rates: us: 64 Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps

Maximum Output Lines: Asynchronous: 2 Output Transmission Mode: Full-

Duplex Output Line Transmission Rate Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - Up to 64,000 bps Communications Protocols: HDLC

(CCITT X.205 Level 2), CCITT X.25 (Level 3) Features: Automatic Speed Detection (Autobaud), Data Compression, Protocol Conversion. Downline Loading (On-Line Reconfiguration), Polling, Port Contention, Switching, Operational and Statistical Reports. Flow Control, Programmable, Network

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,500 to \$50,000 Date First Installed: 1981

# CS01-H

Clock

Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop Maximum Input Channels:

Synchronous: 64 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, External

Maximum Output Lines: Synchronous: 64 Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex **Output Line Transmission Rates**:

Asynchronous - 1,200 bos, 1,800 bos, 2,400 bos, 4,800 bos, 9,600 bps, 14,400 bps, External Clock Communications Protocols: Ascii Distribution Method: End user. OEM, Third-party (See Vendor Profile Page V-11)

#### EMULEY CORP.

C811-F Multiplexer Class: Statistical Input Interface: RS-232C, Current Loon

Maximum Input Channels: Synchronous: 48 Input Transmission Rates Asynchronous - 50 bos. 75 bos. 110 bos, 300 bos, 600 bos, 1,200 bos, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, External Clock

Maximum Output Lines: Synchronous: 48 Output Transmission Mode: Half-Duplex, Full-Duplex **Output Line Transmission Rates:** Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bos. 14,400 bos. External Clock Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: End user, OFM Third-party

C811-H Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop

Maximum Input Channels: Synchronous: 64 Transmission Mode: Half-Duplex. Full-Duplex, Echopiex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bos, 300 bos, 600 bos, 1,200 bos, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, External Clock

Maximum Output Lines: Synchronous: 64
Output Transmission Mode: Half-Duplex, Full-Duplex, Echopiex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps. 14,400 bps. External Clock Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: End user, OFM. Third-party

#### EMULEY CORP.

CS11-U **Multiplexer Class: Statistical** Input Interface: RS-232C, Current

Maximum Input Channels: Synchronous: 64
Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, External Clock

**Maximum Output Lines:** Synchronous: 64

# Multiplexers

Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Cutput Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,800 bps, 14,400 bps, External Clock Communications Protocols: Asoil Diagnostic Peatures: Local Distribution Method: End user, OFM. Thirk-barty.

EMULEX CORP.

CS11-V Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 32
Asynchronous: 32
Transmission Mode: Half-Duplex,
Full-Duplex

Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps; Synchronous - External Clock Maximum Output Lines:

Synchronous: 32

Asynchronous: 32
Output Trensmission Mode: HalfDuplex, Full-Duplex
Output Line Trensmission Rates:
Asynchronous/Synchronous - 1,200
bps, 2,400 bps, 4,800 bps, 9,600
bps, Asynchronous - 1,800 bps,
14,400 bps, External Clock
Communications Protocols: BSC,
Asrd

Diagnostic Features: Local Distribution Method: End user, OEM, Third-party

EMULEY CORP.

CS21-F Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop

Maximum Input Channels: Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous: 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps

Maximum Output Lines: Synchronous: 16 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: End user, OEM. Third-party

#### EMULEX CORP. CS21-H

CS21-H
Multiplexer Class: Statistical
Input Interface: RS-232C, Current
Loop
Maximum Input Channels:

Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Synchronous: 16
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps, 1,800
bps, 2,400 bps, 4,800 bps, 9,800
bps, 14,400 bps
Communications Protocols: Ascil
Diagnostic Features: Local
Distribution Method: End user.

# OEM, Third-party

CS21-U Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop

Maximum Input Channels: Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Synchronous: 16
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps, 1,800
bps, 2,400 bps, 4,800 bps, 9,600
bps, 14,400 bps, 10,600
bps, 10,600 bps, 10,600
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#### EMULEX CORP.

CS21-Z Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop Maximum Input Chennels:

Synchronous: 16 Transmission Model: Full-Duplex Input Transmission Model: Full-Duplex Input Transmission Rates: Asynchrono.- - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Synchronous: 16
Output Transmission Mode: FullDuplex
Output Line Transmission Retes:
Asynchronous: -1,200 bps. 1,800
bps. 2,400 bps. 4,000 bps. 9,600
bps. 14,400 bps.
Communications Protocols: Ascii
Diagnostic Festures: Local
Distribution Method: End user,
OEM, Third-party

EMULEX CORP. CSM11-MH

Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop Maximum Input Channels:

Synchronous: 64
Trensmission Mode: Half-Duplex,
Full-Duplex
Input Trensmission Rates:
Asynchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Asynchronous: 16
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Rates:
Synchronous - 2,400 bps, 4,800 bps,
9,600 bps

Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request Diagnostic Features: Remote, Local Distribution Method: End user, OEM, Third-party

EMULEX CORP.

CSM11-MU Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop Maximum Input Channels:

Synchronous: 64
Transmission Mode: Half-Duplex, Full-Duplex, Full-Duplex, Input Trensmission Rates:
Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps
Maximum Output Lines:

Asynchronous: 16
Output Transmission Mode: HalfDuplex, Fulf-Duplex
Output Line Transmission Retes:
Synchronous - 2,400 bps, 4,800 bps,
9,600 bps
Features: Automatic Speed
Detection (Autobaud), Downline
Leading (On-Line Reconfiguration),
Automatic Repeat Request
Diagnostic Features: Remote, Local
Distribution Method: End user,
OEM. Third-party

#### EMULEX CORP

CSM21-MU Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop Maximum Input Chennels:

Synchronous: 32
Transmission Mode: Hall-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 4,800 bps,
9,600 bps, 19,200 bps
Maximum Output Lines:

Asynchronous: 16
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Rates:
Synchronous - 2,400 bps, 4,800 bps,
9,600 bps
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request
Diagnostic Features: Remote, Local
Distribution Method: End user,

EMULEX CORP. CSM21-MZ Multiplexer Class: Statistical

OEM, Third-party

Input Interface: RS-232C, Current Loop

Maximum input Channels: Synchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 19,200 bps

Meazimum Output Linea:
Asynchronous: 16
Output Transmission Mode: FuliDuplex
Output Transmission Ratea:
Synchronous -2,400 bps, 4,800 bps,
9,600 bps
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request
Diagnostic Features: Remote, Local
Distribution Method: End user,
OFM. Thirt-Charthy.

EMULEX CORP. CSM21-NH

CSM21-NH Multiplexer Class: Statistical Input Interface: RS-232C, Current Loop

Maximum Input Channels: Synchronous: 32 Transmission Mode: Half-Duplex, Fulf-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Maximum Output Lines:

Asynchronous: 16
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Retes:
Synchronous: 2-400 bps, 4,800 bps,
9,600 bps
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request
Diagnostic Features: Remote, Local
Distribution Method: End user,
OEM, Third-party

ERICSON PROGMATIC, INC.

Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Transmission Mode: Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96

Maximum Output Lines:
Asynchronous: Output Transmission Mode: FullDuplex, Echoplex
Output Line Transmission Rates:
Synchronous - 1,200 bps. 1,800 bps.
2,400 bps. 4,800 bps. 9,800 bps
Communications Protocols: HDLC
(CCITT X.205 Level 2)
Features: Automatic Speed

Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request Diagnostic Features: Local Distribution Method: End user Price: \$990 Number Installed to Date: Under

100 (See Vendor Profile Page V-11)

ERICSON PROGMATIC, INC. 1112

Multiplexer Class: Statistical nput Interface: RS-232C Maximum Input Channels: Synchronous: 2 Transmission Mode: Full-Duplex.

Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96

Maximum Output Lines:

Asynchronous: 1 Output Transmission Mode: Full-Duplex, Echoplex **Output Line Transmission Rates** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps (CCITT X.205 Level 2) Feetures: Automatic Speed Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request
Diagnostic Features: Local
Distribution Method: End user Price: \$1,140 Number Installed to Date: Under

#### ERICSON PROGMATIC, INC.

1114 **Multiplexer Class: Statistical** Input Interface: RS-232C **Maximum Input Channels:** Synchronous: 4

Asynchronous: 1
Transmission Mode: Full-Duplex, Echoplex Input Transmission Rates: Asynchronous/Synchronous - 50

bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps; Asynchronous - 7,200 bps, 9,600 bos

**Aggregate Transmission Rate: 96** bps

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex, Echoplex **Output Line Trans** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps cations Protocols: HDLC (CCITT X.205 Level 2) Festures: Automatic Speed Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request Diagnostic Features: Local

Distribution Method: End user Price: \$1.510 imber installed to Date: Under

ERICSON PROGMATIC, INC.

lexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 8 Asynchronous: 1 anamission Mode: Full-Duplex.

Trans

Echoplex Asynchronous/Synchronous - 50 bos. 75 bos. 110 bos. 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps; Asynchronous - 7,200 bps, 9,800

bos **Aggregate Transmission Rate: 96** 

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex, Echoplex **Output Line Transmission Rate** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration). Automatic Repeat Request Distribution Method: End user Price: \$2,150 Number Installed to Date: Under

FIBRORICS INTERNATIONAL.

FM 814 Multiplex er Class: Fiber-Optic Input Interface: RS-232C Maximum Input Channels: Synchronous: 16

Asynchronous: 4 ansmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 19,200 bps; Asynchronous/Synchronous - Up to 64,000 bps **Output Transmission Mode: Full-**Duplex Communications Protocols Transparent to User Features: Automatic Speed Detection (Autobaud), Polling Diagnostic Features: Remote, Local Price: \$2,000 to \$2,800 Date First installed: 1981 Number installed to Date: Under (See Vendor Profile Page V-12)

FIBRONICS INTERNATIONAL. INC. FM 818

Multiplexer Class: Fiber-Optic Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 16 Asynchronous: 8 nission Mode: Full-Duplex input Transmission Rates:

Asynchronous - 19,200 bps; Asynchronous/Synchronous - Up to 64,000 bps **Output Tran** mission Mode: Full-Duplex Communications Protocols: Transparent to User Features: Automatic Speed Detection (Autobaud), Polling Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,300 to \$4,900 Date First Installed: 1981 Number Installed to Date: Under

FIBRONICS INTERNATIONAL

FM 832 Multiplexer Class: Fiber-Optic Input Interface: RS-232C, RS-422. CCITT V.24/V.28, V.35,T-1,RS-449 Maximum Input Char

Synchronous: 128 Asynchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 19,200 bos Synchronous - Up to 64,000 bps **Output Transmission Mode: Full-**Duplex
Output Line Transmission Rates: Communications Protocols: Transparent to User Peatures: Polling
Diagnostic Features: Remote, Local
Distribution Method: End user Price: \$5,400 to \$15,000 Date First Installed: 1983 Number Installed to Date: Under

FIBRONICS INTERNATIONAL, INC.

FM 1608 Multiplexer Class: Fiber-Optic Input Interface: IBM 3270, ITT Maximum Input Channels:

mission Mode: Full-Duplex input Transmission Rates: Asynchronous - 23,580 bps **Output Transmission Mode: Full** Duplex Communications Protocols: IBM 3270, ITT, Raytheon Features: Polling Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,300 to \$2,200 Date First Installed: 1983 Number Installed to Date: Under

FIBRONICS INTERNATIONAL,

FM 1832 Multiplexer Class: Fiber-Optic Maximum Input Channels: Synchronous: 32 Transmission Mode: Full-Duplex Input Transmission Rates:

Asynchronous - 23,580 bps

**Output Transmission Mode: Half-**Dunley Communications Protocols: IBM 3270, ITT, Raytheon Features: Polling, Fiber Optic or

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,825 to \$4,900 Date First installed: 1982 Number installed to Date: 100 - 500

FRIEDMAN ASSOCIATES DATAGRAM DM900 Multiplexer Class: Statistical Input Interface: RS-232C

ximum Input Char Synchronous: 9
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 110 bps, 300 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 768 Maximum Output Lines:

Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 14,400 bps munications Proto (CCITT X.25 Level 2) Feetures: Automatic Spa Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Polling, Port Contention, Flow Control Diagnostic Features: Local Distribution Method: End user Price: \$1 550 to \$2 750 Date First Installed: January 1982 (See Vendor Profile Page V-12)

FRIEDMAN ASSOCIATES DATAGRAM DM1600 Multiplexer Class: Statist Input Interface: RS-232C

**Maximum Input Channels:** Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 540

Maximum Output Lines: Synchronous: 16 Asynchronous: 1 **Output Transmission Mode: Full-**Duplex Output Line Transmission Rates Synchronous - 2,400 bps, 4,800 bps, 9,600 bos Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Port Contention, Operational and Statistical Reports, Flow Control Diagnostic Features: Local Distribution Method: End user Price: \$2,900 to \$5,000 Date First Installed: January 1981

FRIEDMAN ASSOCIATES DATAGRAM DM4800 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 52 anamission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 540 lips Maximum Output Lines:

Synchronous: 56
Aaynchronous: 16
Output Transmission Mode: FullDuplex
Output Ine Transmission Retes:
Synchronous - 2,400 bps. 4,800 bps
Communications Protocols: HDLC
(CCITT X.205 Level 2)
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Port Contention, Flow Control
Jeggnostic Features: Local

ution Method: End user

ò

Date First Installed: June 1981
FRIEDMAN ASSOCIATES
NEC STAT MUX
Multiplexer Class: Statistical

Price: \$3,600 to \$13,200

Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Meximum Output Lines:

Asynchronous: 2 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 9,600 bos Communications Prot (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Switching, Flow Control Diagnostic Features: Local Distribution Method: End user Price: \$35,000 Date First Installed: April 1982

FUJITSU AMERICA, INC. F 1951A Multiplexer Class: Statistical

Input Interface: RS-232C Maximum Input Channels: Synchronous: 16

Asynchronous: 16
Transmission Mode: Echoplex
Input Transmission Rates:
Asynchronous/Synchronous - 75
bps, 110 bps, 300 bps, 600 bps,
1,200 bps, 1,800 bps, 2,400 bps,
3,600 bps, 4,800 bps, 7,200 bps,
9,600 bps
Aggregate Transmission Rate:

1,530 bps Maximum Output Lines: Asynchronous: 2

Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 19,200 bps Communications Protocols: SDLC Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Phylack Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, LCD Display; Prompting Protocol Configuration Diagnostic Features: Remote, Local Distribution Method: CEM Date First Installed: October 1983 Number Installed to Date: 10 Number Installed to Date: Under

(See Vendor Profile Page V-12)

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Chennels:

Synchronous: 16
Transmission Mode: Half-Duplex,
Full-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 500 bps,
4,800 bps, 7,200 bps, 9,800 bps
4,800 bps, 7,200 bps, 9,800 bps
Aggregate Transmission Rate: 576
bps
Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 1 200 bps 1,800 bp

Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Communications Protocols: HDLC (CCITT X.205 Level 2), CCITT X.25 (Level 3), Ascii Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control. Programmable, Supports HP **ENQ/ACK Protocol** Diagnostic Features: Local Distribution Method: End user Price: \$2,650 to \$5,750 Date First Installed: 1981 Number Installed to Date: Under

100 (See Vendor Profile Page V-12)

GANDALF DATA, INC. PIN 9103

PIN 9103 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Maximum input Channels: Synchronous: 32 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 768 bps.

Maximum Output Lines:

Output Transmission Mode: Full-Dunlex **Output Line Transmission Rates:** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bos Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic S Detection (Autobaud), Downline Loading (On-Line Reconfiguration), **Automatic Repeat Request** Operational and Statistical Reports, Flow Control, Programmable, Priority Channel Assign Diagnostic Features: Local Distribution Method: End user Price: \$1,650 to \$7,150 Date First Installed: 1979 Number Installed to Date: 500 -

LANDALF DATA, INC. PIN 9106 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT

1.000

V.24/V.28

Maximum Input Channels: Synchronous: 4 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps,

4,800 bps, 9,600 bps
Aggregate Transmission Rate: 192
bps

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 9,600 bps Communications Protocols: SDLC Features: Automatic Speed Detection (Autohaud) Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control, Builtin for Test Pattern Generation Diagnostic Features: Remote, Local Distribution Method: End user Price: \$825 to \$1,085 Date First installed: 1983 Number installed to Date: Under

GANDALF DATA, INC.

GLM 504 Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Asynchronous: 4 Transmission Mode: Half-Duplex, Full-Duplex Aggregate Transmission Rate: bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 56,000 bps;
Asynchronous/Synchronous - Up to

64K hos

Features: EIA Signal Throughput Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,550 Date First Installed: 1981 Number Installed to Date: Under 100

GANDALF DATA, INC. LINE MISER-MUX4/MUX8 Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Transmission Mode: Half-Duplex, Full-Duplex input Transmission Retes: Input Transmission Retes: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps 4,800 bps, 7,200 bps, 9,000 bps Aggregate Transmission Rete: 984 bps

Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplox
Features: Port Contention,
Switching
Degnostic Features: Remote, Local
Distribution Method: End user
Price: \$850 to \$850
Date First Installed: January 1984
Number Installed to Date: Under

GANDALF DATA, INC. LINE MISER-T1 MUX Multiplexer Class: Wideband (T-1) input Interface: RS-232C Maximum input Channels:

Synchronous: 128
Transmission Mode: Hall-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps,
4,800 bps, 7,200 bps, 9,600 bps,
19,200 bps
Aggregate Transmission Rate:
3,072 bps

Maximum Output Lines: Asynchronous: T-I Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous -T-I Communications Protocols: Bipolar RTZ Features: Flow Control,

Synchronous to PBX, Transparent Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,200 Number Installed to Date: Under 100

GANDALF DATA, INC. LINE MISER-T1 MUX Multiplexer Class: Wideband (T-1) Input Interface: RS-232C

Maximum Input Channels: Synchronous: 128 Transmission Mode: Half-Duplex,

Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 3,072 bps

Maximum Output Lines: Asynchronous: T-1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates:

Asynchronous - T-1 Communications Protocols: Bipolar RTZ

Features: Flow Control, Synchronous to PABX, Transparent Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,200

Number installed to Date: Under 100

QENCOMP, INC.
ASYNCHRONOUS MULTIPLEXER
MODEL 2033
Multiplexer Class: TDM
Input Interface: RS-232C, Current

Loop Maximum Input Channels:

Synchronous: 128
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps,
4,800 bps, 7,200 bps, 9,600 bps,
19,200 bps

Aggregate Transmission Rate: 1,536 bps Output Line Transmission Rates: Asynchronous - Direct Connect to PDP-11

Communications Protocols: Ascii Diagnostic Features: No Distribution Method: OEM Price: \$1,000 to \$3,000 Date First Installed: 1979 Number Installed to Date: 500 -1,000 (See Vendor Profile Page V-13)

GENCOMP, INC. ASYNCHRONOUS MULTIPLEXER MODEL 2035 Multiplexer Class: TDM

Multiplexer Class: TDM Input Interface: RS-232C, Current Loop Maximum Input Channels:

Synchronous: 128
Transmission Mode: Full-Duplex,
Echoplex
Input Transmission Rates:

Input Transmission Rates: Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps, 134.5M bps, 150M bps

Aggregate Transmission Rate: 1,500 bps Output Line Transmission Rates: Asynchronous - Direct Connect to PDP-11

Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: End user Price: \$2,000 to \$3,000 Number Installed to Date: Under 100

GENCOMP, INC.
ASYNCHRONOUS MULTIPLEXER
MODEL 2133
Multiplexer Class: TDM

Input Interface: RS-232C Maximum Input Channels:

Synchronous: 128
Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 13,45M bps, 150M bps Aggregate Transmission Rate: 500 bps

Output Line Transmission Rates: Asynchronous - Direct Connect to LSI

Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: OEM Price: \$900 Date First Installed: March 1983 Number Installed to Date: Under

QENCOMP, INC.
ASYNCHRONOUS MULTIPLEXER
MODEL 2135
Multiplexer Class: TDM
Input Interface: RS-232C, Current
Loop
Maximum Input Channels:

Synchronous: 128
Transmission Mode: Full-Duplex, Echoplex
Echoplex
Input Transmission Rates:
1300 bps, 1200 bps, 1300 bps, 2400 bps, 1200 bps, 1,800 bps, 2,400 bps, 1,800 bps, 2,400 bps, 4,800 bps, 1,800 bps, 3,900 bps, 1,9200 bps, 1,

1,500 bps
Output Line Transmission Rates:
Asynchronous - Direct Connect to
LSI-11

Communications Protocols: Ascii Diagnostic Features: Local Distribution Method: OEM Price: \$2,000 to \$3,000 Number Installed to Date: Under 100

GENERAL DATACOMM INDUSTRIES, INC. GENNET 1261 Multiplexer Class: Network Concentrator

input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels: Synchronous: 8

Transmission Mode: Half-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 96

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Retes: Asynchronous/Synchronous - Up to

19,200 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control

Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,400 to \$2,200 Date First Installed: December 1983 Number Installed to Date: Under

100 (See Vendor Profile Page V-12)

GENERAL DATACOMM IMDUSTRIES, INC. GENNET 1262

Multiplexer Class: Network Concentrator Input Interface: RS-232C, RS-422, RS-423, CCITT V.24/V.28, V.10, V.11

Maximum Input Channels: Synchronous: 96 Asynchronous: 96 Transmission Mode: Full-Duplex,

Echoplex, Input Transmission Rates: Asynchronous - 50 bps to 19,200

Aggregate Transmission Rate: 760 bps Maximum Output Lines:

Asynchronous: 4 **Output Transmission Mode: Full-**Dunley Output Line Transmission Rates: Asynchronous/Synchronous -256,000 bos (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, Split Rates, Intelligent Front Panel Diagnostic Features: Remote, Local Distribution Method: End user Date First Installed: June 1983

GENERAL DATACOMM INDUSTRIES, INC. MEGAMUX (TDM 1257/1258) Multiplexer Class: TDM Input Interface: RS-232C, RS-422, RS-423, CCITT V.24/V.28, MIL 188C, CCITT V.703

Number installed to Date: Under

Maximum Input Channels: Synchronous: 54 Asynchronous: 54 Asynchronous: 54 Transmission Mede: Full-Duplex Input Transmission Retes: Asynchronous - 50 bps, 75 bps, 110 bps, 490 bps, 1,200 bps, 1,800 bps, 2,400 bps, 1,200 bps, 1,800 bps, 7,200 bps, 3,900 bps; Synchronous - 19,200 bps Aggregate Transmission Rate: 20,400 bps

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 256,000 bps Features: Automatic Speed Detection (Automaud), Network Monitor, Filber-Optic Aggregrate Interface Diagnostic Features: Remote, Local Distribution Method: End under Price: \$6,000 to \$35,000 Date First Installed: June 1981 Number Installed to Date: 500

GENERAL DATACOMM INDUSTRIES, INC. TDM 1209 SERIES Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28 Maximum input Channels:

Synchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 150 bps, 300 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 96 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous: -1,200 bps, 2,400 bps, 4,800 bps, 9,800 bps Communications Protocols: Ascil Disgnostic Features: Local Distribution Method: End user Price: 9950 to \$1,200 Date First Installed: April 1981 Number Installed: April 1981 Number Installed: 1,000 -5,000

GTE NETWORK SYSTEMS

9004 A/B Multiplexer Class: Statistical Multiplexer Maximum Input Channels:

Synchronous: 24
Transmission Mode: Full-Duplex
input Transmission Rates:
Synchronous - 4,800 bps, 56,00
bps
Appropriate Transmission Rate:

Aggregate Transmission Rate:
1.3K bps
Maximum Output Lines: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
1.5K bps
Features: Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user

Price: \$15,000
Date First Installed: June 1983
Number Installed to Date: Under 500
(See Vendor Profile Page V-13)

HALCYON COMMUNICATIONS 4001

Multiplexer Class: Statistical input interface: RS-232C Maximum Input Channels: Synchronous: 32

Synchronous: 32 Transmission Mode: Echoplex Input Transmission Rates: Synchronous - 50 bps, 9,600 bps Aggregate Transmission Rate: 48 bps

# Multiplexers

**Maximum Output Lines:** Asynchronous: 1 Other: Split Link **Output Trens** mission Mode: Full-Dunlex **Output Line Transmi** sion Rates: Synchronous - 9,600 bps mmunications Protocols: HDLC (CCITT X.205 Level 2) Feetures: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Programmable, Network Monitor, Remote Term Control Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,700 to \$4,100 Date First Installed: 1982 Number Installed to Date: Under 100 (See Vendor Profile Page V-13)

HALCYON COMMUNICATIONS 4220 Multiplexer Clean: Statistical Input Interface: RS-232C

Maximum Input Channels: Synchronous: 60 Asynchronous: 80 Transmission Mode: Echoplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 9,600 bps Aggregate Transmission Rate: 48 bps

Maximum Output Lines: Synchronous: 2 Asynchronous: 1 Other: Split Link Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Synchronous - 9,600 bps cols: HDLC **Communications Proto** (CCITT X.205 Level 2) Feetures: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Polling, Operational and Statistical Reports, Programmable, Network Monitor, Executive Port Option Port Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,800 to \$6,500 Date First Installed: 1982 Number installed to Date: Under

1884
3299
âlultiplexer Class: Terminal Multiplexer
Maximum Input Channels:
Synchronous: 8
Maximum Output Lines:
Synchronous: 1
Gee Vendor Profile Page V-14)

INFINET, INC. MX400 Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Asynchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 1,200 bps, 2,400 bps, 4.800 bos Aggregate Transmission Rate: 48 bos Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 4,800 bps Features: Programmable Diagnostic Features: No Distribution Method: End user Price: \$300 Number installed to Date: 1.000 -5,000 (See Vendor Profile Page V-15)

MX496
Multiplexer Class: TDM
Input Interface: RS-232C
Maximum Input Channels:
Asynchronous: 4
Transmission Mode: Full-Duplex
Input Transmission Rates:

INFINET, INC.

Transmission Mode: Full-Duplex input Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Retea:
Synchronous: 9,600 bps
Features: Programmable, Tracks
Fallback Rate of Modern
Diagnostic Features: No
Distribution Method: End user
Price: \$800
Number inestalled to Date: 100 - 500
INSTINET, INC.

MX600

Multiplexer Class: TDM

Input Interface: RS-232C

Maximum Input Channels: Asynchronous: 6 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps; Asynchronous/Synchronous - 14,400 bps. 120,000 bps **Aggregate Transmission Rate: 144** bos Output Transmission Mode: Full-Dunlex **Output Line Transmission Rates:** Synchronous - 19,200 bps mmunications Protocols: HDLC (CCITT X.205 Level 2), SDLC, BSC Features: Programmable Diagnostic Features: No Distribution Method: End user Price: \$1,000

IMFOTRON SYSTEMS CORP.
792 NETWORK CONCENTRATOR
Multiplexer Class: Network
Concentrator
Input Interface: RS-232C, CCITT
V.24/V.28

Number installed to Date: Under

Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,800 bps
Aggregate Transmission Rate:
3,072 bps
Communications Protocols: BSC, Ascill
Features: Automatic Speed
Detection (Autobaud), Switching,
Flow Centrol
Disgnostic Features: Remote, Local

Input Transmission Rates:

INFOTRON SYSTEMS CORP.
SM480 WITH 790NC OR 792NC
Multiplexer Class: Network
Concentrator
Maximum Input Channels:
Asynchronous: 8

(See Vendor Profile Page V-16)

Price: \$4,500 to \$7,900

Asynchronous: 8
Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 2,400 bps, 2,400 bps, 2,400 bps, 2,600 bps, 134.5M bps, 200M bps Aggregate Transmission Rate: 768 bps
Maximum Output Lines:

Asynchronous: 3
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous/Synchronous - Up to
9,600 bps
Communications Protocols: SDLC,
Ascil, Baudot
Features: Automatic Repeat
Request, Port Contention, Switching,
Flow Control
Price: \$1,200

INFOTROM SYSTEMS CORP. SM680 WITH 790NC OR 792NC Multipleser Class: Network Concentrator Maximum input Channels: Asynchronous: 16

Asynchronous: 16 Input Transmission Rates: Asynchronous/Synchronous - 9,600 bps

Aggregate Transmission Rate: 384 bps Features: Port Contention, Switching, Flow Control Price: \$1 200

INFOTRON SYSTEMS CORP. SUPERMUX 790 Multiplexer Class: Network Concentrator input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 640 Asynchronous: 640 Tranamission Mode: Half-Duplex, Full-Duplex, Input Transmission Rates: Asynchronous - 50 pps, 75 pps, 110 pps, 300 pps, 600 pps; Asynchronous/Synchronous - 1,200 pps, 1,800 bps, 2,400 pps, 3,600 pps, 4,800 bps, 7,200 pps, 9,600 pps, 4,800 pps, 7,200 pps, 9,600 pps Maximum Output Lines:
Asynchronous: 15
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Retes:
Asynchronous/Synchronous - 72,00
bps
Features: Downline Loading (OnLine Reconfiguration), Port
Contention, Switching, Flow Control,
Network Monitor, Optional ANM 800
Network Monitor
Diagnostic Features: Local

INFOTRON SYSTEMS CORP.

Input Interface: RS-232C, CCITT

SUPERMUX 380 STAT MUX

Multiplexer Class: Statistica

Price: \$4,600 to \$7,100

V 24/V 28 DR-25-P Meximum Input Cha Synchronous: 8 mission Mode: Half-Duplex, Full-Duolex Input Transmission Rates Synchronous - Up to 9,600 bps Aggregate Transmission Rate: 768 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Synchronous - 1,200 bps. 1,800 bps. 2,400 bps, 4,800 bps, 9,600 bps, 14.400 bos Communications Protocols: SDLC Features: Automatic Speed

IMFOTROM SYSTEMS CORP. SUPERMUX 480 STAT MUX Multiplexer Cleas: Statistical Input interface: RS-232C, 20 mA or 60 mA Current Loop Maximum Input Channels:

Detection (Autobaud), Downline

Flow Control. Programmable

Price: \$1,375 to \$1,750

Loading (On-Line Reconfiguration).

Diagnostic Features: Remote, Local

Synchronous: 8 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 768

bps Output Line Transmission Rates: Synchronous - 2,400 bps, 4,800 bps; Asynchronous/Synchronous - Up to 9,600 bos

Communications Protocols: HDLC Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC Features: Automatic Speed Detection, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control Diagnostic Features: Local Price: \$1.900 to \$6.000

INFOTROW SYSTEMS CORP.

SUPERMUX 616
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24V.28
Maximum Input Chennels:
Synchronous: 16
Asynchronous: 16
Input Treasmission Rates:
Asynchronous/Synchronous - 50

bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps; Synchronous - 50 bps to 9,600 bps

Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Asynchronoue: 1
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Port Contention, Switching
Diagnostic Features: Remote, Local
Price: \$5,500
Dete First Installed: 1982

SUPERMUX 632
Multipleyer Class: Statistical

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 32
Asynchronous: 32
Input Transmission Rates:
Asynchronous/Synchronous - 50
bps, 75 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,800 bps, 2,400
bps, 3,600 bps, 4,800 bps, 7,200
bps, 9,600 bps
Aggregate Transmission Rate: 192

lps
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Port Contention, Switching
Diagnostic Features: Remote, Local
Price: \$9.000
Date First Installed: 1982

INFOTRON SYSTEMS CORP. SUPERMUX 680 STAT MUX Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 244/25

Maximum Input Channels: Synchronous: 32 Asynchronous: 32 Transmission Mode: Half-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 1,800 bps, 2,400 bps, 4,800 bps,

Asynchronous - 50 bps, 75 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,800 bps, 134.5M bps, 150M bps; Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps Aggregate Transmission Rate: 384 bps
Maximum Output Lines:

Asynchronous: 3 Output Transmission Mode: Half-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps;

Asynchronous/Synchronous - Up to 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC Features: Automatic Speed Detection (Autobaud), Downline

Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control Diagnostic Features: Remote, Local Price: \$3,000 to \$5,200

INFOTRON SYSTEMS CORP. SUPERMUX 750 STAT MUX Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28, DB-25-P Maximum Input Channels:

Synchronous: 128
Asynchronous: 128
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 134.5M bps, 150M bps;
Asynchronous/Synchronous - 1,200

Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384

bps
Output Line Transmission Rates:
Asynchronous/Synchronous - Up to
19.200 bps

19,200 bps
Communicationa Protocola: HDLC
(CCITT X.205 Level 2), SDLC
Features: Automatic Speed
Detection (Autobaud), Data
Compression
Diagnostic Features: Remote, Local

INFOTRON SYSTEMS CORP. T1 MULTIPLEXER Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Price: \$1,700

Price: \$4,800

Asynchronous: 48 input Transmission Rates: Asynchronous/Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,800 bps, 19,200 bps Output Line Transmission Rates: Asynchronous - T-1 Communications Protocols: HDLC (CCITT X.052 Level 2) Diagnostic Features: Remote, Local bistribution Method: End user

INFOTRON SYSTEMS CORP. TIMELINE 180 MULTIPLEXER Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28, MIL 188C

Maximum Input Channels: Synchronous: 18 Input Transmission Rates: Synchronous - 37.5 bps to 9,600 bps Aggregate Transmission Rate: 192

Output Line Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 9,600 bps Features: Automatic Speed

Detection (Autobaud)
Diagnostic Features: Remote, Local
Price: \$1,700
Date First Installed: 1975

INFOTRON SYSTEMS CORP. TIMELINE 280 MULTIPLEXER Multiplexer Class: TDM Input Interface: RS-232C, CCITT

V.24/V.28

Maximum Input Channels: Asynchronous: 24 Input Transmission Rates: Asynchronous/Synchronous - Up to 19,200 bps

Aggregate Transmission Rate: 640 bps
Diagnostic Features: Local

Price: \$1,800 Date First installed: 1976

IMFOTRON SYSTEMS CORP.
TIMELINE 290 MULTIPLEXER
Multiplexer Class: TDM
Input Interface: RS-232C, CCITT

V.24/V.28 Maximum Input Channels:

Asynchronous: 4 input Transmission Rates: Asynchronous/Synchronous - Up to 7,200 bps Aggregate Transmission Rate: 96 bps

Diagnostic Features: Local Price: \$1,950 Date First Installed: 1976

INTEGRATED DESIGN ENGINEERING, INC. IDE-250BA, -250CA Multiplexer Class: Concentrator input Interface: RS-232C Maximum Input Channels:

Synchronous: 16 Transmission Mode: Half-Duplex, Echoplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps. 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Synchronous: 1
Output Transmission Mode: HalfDuplex, Full-Duplex
Output Line Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1200 bps

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Communications Protocols: Ascii,

IDE Protocol
Feetures: Data Compression,
Protocol Conversion, Flyback
Buffering Delay, Port Contention,
Switching, Programmable
Diagnostic Feetures: Local
Distribution Method: End user
Price: \$1,600 to \$6,850
Date First Installed: 1979
Number Installed

INTERACTIVE SYSTEMS/3M MODEL 6330 STAT MUX Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 32

# Meet The Cordless Wonder

# New mLDS 122 ASYNC SHORT-HAUL

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Gandalf Data, Inc. 1019 S. Noel Ave. Wheeling, IL 60090/TWX: 910-651-4951

# Multiplexers

Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps;
Asynchronous/Synchronous - 1,200 bps, 1,600 bps, 2,400 bps, 4,800 bps, 9,600 bps to 76,800 bps;
Synchronous - 3,600 bps, 7,200 bps, 19,200 bps
Aggregate Transmission Rate:

Aggregate Transmission Rate: 3,072 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 76,000

Pagination busics syntations in the page 20 ptg 20

INTERACTIVE SYSTEMS/3M MODEL 6800

Multiplexer Class: TDM Input Interface: IBM 3274 CRTS Maximum Input Channels:

Asynchronous: 32 Transmission Mode: Half-Duplex Input Transmission Rates: Asynchronous/Synchronous - 4.7K bos

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Half-Duplex Output Line Transmission Rates: Asynchronous/Synchronous - 4.7K bps Communications Protocols: IBM 2274 Type 'A' CRT Diagnostic Features: Los Distribusion Marthod: End user Price: 51.600 to \$3,090 Date First Installed: 1981

Number installed to Date: 500 -

INTERBUSINESS CORP.
DUAL MUX A
Multiplexer Class: Statistical
Input Interfece: RS-232C
Maximum Input Channels:

1.000

Synchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,300 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,800 bps Aggregate Transmission Rate: 192 bps Output Transmission Mode: Full-

Duplex
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Protocol Conversion,
Downline Loading (On-Line

Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user, OEM Price: \$995 Date First Installed: June 1985 Number installed to Date: Under 100 (See Vendor Profile Page V-16)

INTERBUSINESS CORP.
DUAL MUX S
Multiplexer Class: Statistical
Input Interface: RS-232C
Maximum Input Channels:

Asynchronous: 2 Transmission Mode Full-Duplex input Transmission Rates: Synchronous - 300 bps, 600 bps, 1,200 bps, 1,300 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 192 bps Output Transmission Mode: Full-

Duplex
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Protocol Conversion,
Downline Loading (On-Line
Reconfiguration), Automatic Repeat
Request, Flyback Buffaring Deley,
Flow Control, Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user, OEM

Price: \$695 Date First Installed: June 1983 Number Installed to Date: Under 100

INTERBUSINESS CORP. QUAD MUX S Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Asynchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 300 bps, 500 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,800 bps Aggregate Transmission Rate: 384 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Protocol Conversion,
Downline Loading (On-Line
Reconfiguration), Automatic Repeat
Request, Flyback Buffering Delay,
Flow Control, Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user, OEM
Price: \$1,150
Date First Installed: June 1983
Number Installed: June 1983
Number Installed to Date: Under

INTERBUSINESS CORP.
QUAD MUX 4 CHANNEL STAT MUX
Multiplexer Class: Statistical
Input Interface: RS-232C
Maximum Input Channels:

Synchronous: 4
Transmission Mode: Full-Duplex
Input Transmission Rates:

Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps
Aggregate Transmission Rate: 384 bps
Maximum Output Lines:

Synchronous: 1
Output Transmission Mode: Full
Duplex

Duplex
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Protocol Conversion,
Downline Loading (On-Line
Reconfiguration), Automatic Repeat
Request, Fryback Buffering Delay,
Flow Control, Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user, OEM
Price: \$1.150
Date First Installed: June 1983
Number Installed to Date: Under
100.

INTERFACE ELECTRONICS, INC.

SLAM Multiplexer Class: Interface Board Input Interface: RS-232C Maximum Input Chennels:

Synchronous: 16
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps,
4,800 bps, 7,200 bps, 9,600 bps,
19,200 bps
Maximum Output Lines:

Synchronous: 16
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps, 1,800
bps, 2,400 bps, 4,800 bps, 1,800
bps, 14,400 bps, 9,600
bps, 14,400 bps, 9,600
bps, 14,400 bps
Communications Protocols: Ascil
Features: Local
Disgnostic Features: Local
Distribution Method: OEM
Price: \$1,900
Date First Installed: 1979
Number Installed to Date: Under

(See Vendor Profile Page V-16)

INTERLAM, INC.
NTS-10 TERMINAL SAVER
Multiplexer Class: Statistical
Input Interface: RS-232C
Transmission Mode: Hall-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps,
4,800 bps, 7,200 bps, 9,600 bps,
1,800 bps

Aggregate Transmission Rate: 384 bps
Output Transmission Mode: Half-Duplex, Full-Duplex
Output Line Transmission Rates: Asynchronous - 10K bps
Communications Protocols: XNS
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request, Flyback
Buffering Delay, Polling, Port

Contention, Switching, Flow Control, Network Monitor Diagnostic Feetures: Remote, Local Distribution Method: End user Price: \$400 Date First Installed: September 1983 Number Installed to Date: Under 100 (See Mendor Profile Rese V-18)

INTER-LIMK
LN-1000
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24/V.28

Maximum Input Channels: Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echopia Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 80 bps

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 2,400 bps, 4,800 bps, 9 600 bps Communications Protocols: HDLC Proprietary Features: Automatic Speed Detection (Autobaud), Data Compression, Protocol Conversion. Automatic Repeat Request, Port Contention, Flow Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$995 to \$1,635 Date First Installed: 1982 Number Installed to Date: Under

INTER-LINK LN-2000 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

(See Vendor Profile Page V-16)

100

Maximum Input Channels: Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous: 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 80 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Synchronous - 2,400 bps, 4,800 bps, 9,000 bps
Gommunications Protocols: CCITT
X.25 (Level 3)
Features: Automatic Speed
Detection (Autobaud), Data
Compression, Protocol Conversion,
Automatic Repeat Request, Fort
Contention, Flow Control

Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1.895 to \$2.695 **Date First Installed:** September 1982 Number installed to Date: Under

#### INTERATION.

LN-4000 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

**Maximum Input Channels:** Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps **Aggregate Transmiss** 

Meximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates**: Synchronous - 2,400 bps, 4,800 bps, 9 600 has Communications Protocols: CCITT X.25 (Level 3) Features: Automatic Speed Detection (Autobaud) Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Port Contention, Operational and Statistical Reports, Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$2,995 to \$3,995 **Date First Installed: Septembe** 

INTERSIL SYSTEMS, INC. 5300 Multiplexer Class: TDM

Number Installed to Date: Under

Input Interface: RS-232C eximum Input Channels: Synchronous: 16 Transmission Mode: Full-Duplex **Aggregate Transmission Rate: 386** 

Maximum Output Lines: Asynchronous: 2 Output Transmission Mode: Full-**Output Line Transmission Rates:** Synchronous - 9,600 bos Communications Protocols: Ascii Features: Automatic Speed Detection (Autobaud), Data Compression, Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Operational and Statistical Reports, Flow Control, Programmable Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,500 to \$2,250 Date First Installed: January 1982 Number Installed to Date: Under

ITT TELECOMM PRODUCTS. D424

Multiplexer Class: TDM Input Interface: RS-232C, RS-449 Maximum Input Channels: Synchronous: 24

Asynchronous: 24 ission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56K bps Output Transmission Mode: Full-Dunlex

**Output Line Transmission Rate** Asynchronous/Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bos. 19.200 bos. 56K bos. T-1 Communications Protocols: HDLC (CCITT X.25 Level 2), SDLC, CCITT X.25 (Level 3), BSC, Ascii, Transparent Diagnostic Features: No Distribution Method: End user Price: \$5.000 - \$50.000

Date First Installed: 1982 Number Installed to Date: 500 -

(See Vendor Profile Page V-17)

LED SYSTEMS, INC. Multiplexer Class: TDM input Interface: RS-232C Maximum Input Channels: Synchronous: 7 Asynchronous: 7

Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 2,400 bps; Synchronous - 9,600 bps Aggregate Transmission Rate: 672 Maximum Output Lines:

Asynchronous: 1 Output Transmission Mode: Full-Dunley **Output Line Transmission Rates** Asynchronous/Synchronous - 76,800 Communications Protocols: Transparent, Infra Red

Features: Switching, Network Monitor Diagnostic Features: Local Distribution Method: Third-party Price: \$13,550 Number Installed to Date: Under

(See Vendor Profile Page V-18)

M/A-COM LINKABIT, INC. MX 24 Multiplexer Class: TDM Input Interface: RS-232C

Maximum Input Channels: Synchronous: 24 Transmission Mode: Full-Duplex input Transmission Rates: Asynchronous - 19,200 bps Aggregate Transmission Rate: 15.400 bos Maximum Output Lines:

Synchronous: 1 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Asynchronous - T-1

Communications Protocols Asynchronous Features: Automatic Speed Detection (Autobaud) Distribution Method: End user Price: \$2 700 to \$5 000 Date First Installed: May 1982 Number Installed to Date: 100 - 500 (See Vendor Profile Page V-18)

MIA-COM LINKABIT, INC.

Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Synchronous: 48 mission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 19,200 bps Maximum Output Lines: Synchronous: 2

**Output Transmission Mode: Full-**Dunlex Output Line Transmission Rates: Asynchronous - 2 T-1 Lines Communications Protocols: Asynchronous Features: Automatic Speed Detection (Autobaud)

Diagnostic Features: No Distribution Method: End user Price: \$5 600 Date First Installed: May 1982

MANAGE, INC. MUX-8

Multiplexer Class: Fiber-Optic Input Interface: RS-232C Maximum Input Channels:

Synchronous: 8 Transmission Mode: Full-Duplex input Transmission Rates Asynchronous - to 19,200 bps Aggregate Transmission Rate: 1,536 bps **Maximum Output Lines:** 

Synchronous: 8 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Asynchronous - 625,000 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT X.25 (Level 3), BSC, Ascii Diagnostic Features: No Distribution Method: End user Date First Installed: November 1983 Number Installed to Date: Under (See Vendor Profile Page V-18)

MEGADATA CORP SM5/X INTERFACE-A **Multiplexer Class:** Network Concentrator Input Interface: RS-232C Maximum Input Channels:

Synchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rate Asynchronous - 50 bps, 19,200 bps Maximum Output Lines: Synchronous: 4 **Output Transmission Mode: Full-**

**Output Line Transmission Rates:** Asynchronous - 14,400 bps ommunications Protocols: Ascii Features: Data Compression,

Protocol Conversion, Downline Loading (On-Line Reconfiguration), Polling, Port Contention. Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,500 Date First Installed: September 1083 Number Installed to Date: Livrey 100 (See Vendor Profile Page V-19)

MEGADATA CORP. SM5/X INTERFACE-S Multiplexer Class: Network Concentrator Input Interface: RS-232C Maximum Input Channels:

Asynchronous: 4 mission Mode: Full-Duplex input Transmission Rate Synchronous - 50 bps, 19,200 bps Maximum Output Lines:

Asynchronous: 4 **Output Transmission Mode: Full-**Dunley Output Line Transmiss Synchronous - 14,400 bps Communications Protocols: BSC Feetures: Data Compression. Protocol Conversion, Downline .oading (On-Line Reconfiguration), Polling, Port Contention, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,500 Date First installed: 1982 Number Installed to Date: Under

MICOM SYSTEMS, INC. INSTALINK460 MODEL M461 Multiplexer Class: FDM Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 1 Transmission Mode: Half-Duplex. Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps. 19,200 bps Aggregate Transmission Rate: 192

**Maximum Output Lines:** Other: Modulated Signal **Output Transmission Mode: Full-**Duplex Features: Automatic Speed Detection (Autobaud) Diagnostic Features: Local Distribution Method: Third-party Price: \$550 to \$575 Date First Installed: March 1983 er Installed to Date: 500 -1.000 (See Vendor Profile Page V-19)

MICOM SYSTEMS, INC. MICRO 200 PORT CONCENTRATOR Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V 24/V 28

(See Vendor Profile Page V-17)

# Multiplexers

Maximum input Channels: Asynchronous: 1 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous -2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 576 bps Maximum Output Lines:

Asynchronous: 8
Output Transmission Mode: Full-

Dunley Output Line Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Network Monitor, Local Switching Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$2.550 to \$3.250 Date First Installed: April 1983 Number Installed to Date: Under

MICOM SYSTEMS, INC. MICRO 500 ERROR CONTROLLER Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum input Channels: Synchronous: 1 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 1,20075 Asymmetrical Aggregate Transmission Rate: 96

**Maximum Ouiput Lines:** Synchronous: 1 Asynchronous: 1 **Output Transmission Mode: Half-**Duplex, Full-Duplex **Output Line Transmission Rates:** Asynchronous - Up to 9,600 bps Features: Data Compression, Protocol Conversion, Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Asynchronous/ Synchronous and Full- and Half **Duplex Conversion** Disgnostic Feetures: Remote, Local Price: \$795 Date First Installed: April 1978 Number Installed to Date: 500 -1.000

MICOM SYSTEMS, INC. MICRO 300/2 DATA CONCENTRATOR Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 16 Asynchronous: 4 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,800 bps, 134.5M bps, 150M bps, 200M bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 768

Maximum Output Lines: Synchronous: 1

Asynchronous: 1 Output Transmission Mode: Full-Duplex

Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,600 bps; Asynchronous/Synchronous - Up to 19,200 bps Features: Automatic Speed

Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyack Buffering Delay, Operational and Statistical Reports, Flow Control, Command Part

Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,050 to \$4,500 Date First Installed: January 1978 Number Installed to Date: 10,000 - 50,000

MICOM SYSTEMS, INC. MICRO 800/X25 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 24 Asynchronous: 8 Full-Duplex, Echoplex Input Transmission Mede: Helf-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous: 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,800 bps, Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps Aggregate Transmission Rate: 768

Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps,

Maximum Output Lines:

2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps
Communications Protocols: CCITT X.25 (Level-3)
Features: Automatic Speed

Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Fort Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Restures: Remote, Local Distribution Method: End user, OEM, Third-party Prices 25, 205 to \$4,600 to \$4,600

Date First Installed: November 1982

MICOM SYSTEMS, INC. MICRO 900/2 MULTIDROP CONCENTRATOR Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps. 1,800 bps, 2,400 bps, 4,800 bps, 9.600 bps: Asynchronous/Synchronous 134.5M bps, ,150M bps, 200M bps Aggregate Transmission Rate: 768 Maximum Output Lines: Synchronous: 1 Asynchronous: 1 **Output Transmission Mode: Full-Output Line Transmission Rates:** Asynchronous/Synchronous - Up to 9,600 bps Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Polling, Operational and Statistical Reports, Flow Control, Network Monitor, Command Port, Battery Backup Diagnostic Features: Remote, Local

MICRO 5000 INTELLIGENT
MODEM
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24V.28
Transmission Mode: Hall-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 110 bps, 300 bps,
600 bps, 1,200 bps, 1,800 bps,
2,400 bps, 4,800 bps, 9,800 bps
Aggregate Transmission Rate: 96
bps
Maximum Output Lines:

Price: \$900 to \$4,600

Number Installed to Date: 500 -

MICOM SYSTEMS, INC.

Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Half-Duplex, Full-Duplex Output Line Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps; Synchronous - 110 bps, 300 bps, 600 bps Features: Data Compression, Protocol Conversion, Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Asynchronous/ Synchronous and Full- and Half-Duplex Conversion Diagnostic Features: Remote, Local Price: \$1.500 to \$3.400 Date First Installed: April 1978 Number installed to Date: 500 -

MICRO 8000 CONCENTRATOR
MODEM
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24V.28
Transmission Mode: Half-Duplex,
Echoplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,800 bps,

MICOM SYSTEMS, INC.

134.5M bps, 150M bps, 200M bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 768

Maximum Output Lines: Synchronous: 1 Asynchronous: 1 Output Transmission Mode: Full-

Duplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps. 1,800 bps. 9,600 pps.
Asynchronous-9/nohronous - Up to 19,200 bps
Pestures: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Physack Buffering dolay, Operational and Statistical Reports, Flow Control Diagnostic Feetures: Local Diagnostic Feetures: Local Disgnostic Feetures: Local Disgnostic Feetures: Local Disgnostic Feetures:

MICOM SYSTEMS, INC.
INSTAMUX470 MDL M474 OR 478
Multiplexer Class: TDM
Input Interface: RS-232C, CCITT

Date First Installed: January 1978 Number Installed to Date: 10,000 -

Price: \$1,650 to \$7,200

Maximum input Channels: Synchronous: 8 Transmission Mode: Half-Duplex,

Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate:

Aggregate Transmission Re 1,536 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 820M bps
Communications Protocols: Bit
Sampled
Features: Automatic Speed
Detection (Autobaud)
Diagnostic Features: Local
Distribution Method: Third-party
Price: \$895 to \$1.050
Date First Installed: October 1982
Number Installed: Diate: 500 -

MICOM SYSTEMS, INC. INSTATRUNK480 MODEL M481 Multiplexer Cless: TDM Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 128 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 12,288 bps Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - T-1
Communications Protocels: Bit
Interleaved
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration)
Diagnostic Features: Remote, Loal
Distribution Method: Third-party
Price: \$3,200 to \$12,800
Data First Installed: November 1983
Number Installed to Date: Under

MICOM SYSTEMS, ING. M4096/4 + Multiplexer Class: TDM Input Interface: RS-232C, CCITT V 24/V 28

Maximum Input Channels: Asynchronous: 4 Transmission Mode: Hall-Duplex, Full-Duplex Input Transmission Rates: Synchronous - 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps Maximum Output Lines:

Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous: 4,800 bps, 9,600 bps
Communications Protocols: All
Synchronous Protocols: All
Synchronous Protocols: All
Synchronous Protocols: All
Synchronous Protocols: All
Line Reconfiguration), Switched
Carrier Simulation
Disgnostic Features: Remote, Local
Disgnostic Peatures: Remote, Local
Distribution Method: Third-parry
Price: 30,985
Date First Installed: September
1983
Number Installed to Date: Under

MICOM SYSTEMS, INC.
MICRO100 LINE MULTIPLEXER
Multiplexer Class: TDM
Input Interface: RS-232C, CCITT
V.35

Maximum Input Channels: Asynchronous: 1 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous: 19,200 bps; Asynchronous/Synchronous - Up to 57,600 bps Aggregate Transmission Rate: 640

Ops
Maximum Output Lines:
Asynchronous: 4
Output Transmission Mode: FullDuplex
Output Transmission Rates:
Synchronous - 4,800 bps, 9,600 bps
Communications Protocols: Bit Interleaved
Features: Automatic Downspeed or Line Delette
Disgnostic Features: Remote, Local Disgnostic Features: Remote, Local Disgnostic Features: Remote, Local Disgnostic Features: September 1979
Price: \$4,900 to \$6,400
Date First Installed: September 1979
Number installed: 10 Dest: 100 - 500

MICOM SYSTEMS, INC.
MICRO700 MODEL M700
Multiplexer Class: TDM
Input Interface: RS-232C, CCITT
V.24/V.28
Maximum Input Channels:
Asynchronous: 4

Asynchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 1,200 bps, 2,400 bps, 4,800 bps Aggregate Transmission Rate: 95 bps

bps
Maximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps
Communications Protocols: Bit
Interfeaved
Transmissions Protocols: Bit
Interfeaved
Transmissions
Transmi

MICROYSO MODEL 1 OR 2 Multiplexer Class: TDM Injust Interface: RS-232C Maximum Injust Channels: Asynchronous: 38 Transmission Mode: Full-Duplex Injust Transmission Rates: Synchronous - 1,200 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps; 4,800 bps, 19,200 bps; 4,900 bps 19,200 bps; 4,900 bps

MICOM SYSTEMS, INC.

259,600 bps
Output Line Transmission Rates:
Synchronous - 9,600 bps, 14,400
bps, 19,200 bps, 56,000 bps;
Asynchronous/Synchronous - Up to
300,000 bps
Communications Protocols: Bit
Interleaved
Eastures: Downline Leading (On-

Festures: Downline Loading (On-Line Reconfiguration), instantaneous Configuation Selection Diagnostic Festures: Remote, Local Distribution Method: Third-party Price: \$2,500 to \$10,000 Date First Installed: 1974 Number Installed: 1974 Number Installed to Date: 500 -1,000

MICOM SYSTEMS, INC.
MICRO 860 CONCENTRATOR
SWITCH
Multiplexer Class: Data
Concentrator Switch
Input Interface: RS-232C, CCITT
V 24/V 28

Maximum Input Channels: Asynchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 1,200 bps, 1,800 bps, 9,600 bps; Asynchronous/Synchronous - Up to 19,200 bps Maximum Output Lines:

Synchronous: 1
Asynchronous: 1
Output Transmission Mode: Half-

Duplex, Full-Duplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 1,200
bps. 2,400 bps. 4,800 bps. 3,900
bps. Synchronous - 14,400 bps. Synchronous - 14,400 bps. Synchronous - 14,400 bps. Features: Automatic Speed betection (Automatic Speed betection (Automatic Speed Detection), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,400
Date First Installed: September 1979
Number installed to Date: Under

MINHTRONICS CORP. MZV-11/8 OCTOMUX Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - Up to 38.4K bps Aggregate Transmission Rate: 3,072 bps Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - Up to 38.K bps Features: Switching, Programmable Features: Switching, Programmable

Diagnostic Features: Local
Distribution Method: End user,
OEM, Third-party
Price: \$1,300
Date First installed: 1983
(See Vendor Profile Page V-20)

MITEL, IMC.
MITEL DATA DEMULTIPLEXER
Multiplexer Class: Demultiplexer
Input Interface: RS-232C
Transmission Mode: Half-Duplex,
Full-Duplex, Echopiex
Input Transmission Retes:
Asynchronous - 300 bps, 1,200 bps
Maximum Output Lines:
Synchronous - 4

Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Output Line Transmission Rates: Asynchronous - 300 bps, 1,200 bps Communications Protocols: Serial Data Link Features: Switching, Programmable Diagnostic Features: Local Distribution Method: Third-party Price: \$850 Date First Installed: June 1982 Number Installed: June 1982 Number Installed: Date: Under 100 (See Vandor Profile Page V-20)

MODULAR COMPUTER SYSTEMS, INC. (MODCOMP) 1907

Multiplexer Class: TDM Input Interface: RS-232C, Current Loop V.35, WE301/303 Maximum Input Channels:

Synchronous: 256 Asynchronous: 256 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps to 250,000 bps Aggregate Transmission Rate: 250 bps Maximum Output Lines:

Synchronous: 256
Output Transmission Mode: HalfDuplex, Full-Duplex, Echopiex
Output Limanmission Mode: HalfDuplex, Full-Duplex, Echopiex
Output Line Transmission Rises:
Asynchronous/Synchronous - 50 bps
Communications Protocols: HDLC
(CCITT X.25 Level 2), SDLC, CCITT
X.25 (Level 3), BSC, Asci, Mannet
Features: Frotocol Conversion,
Downline Loading (On-Line
Reconfiguration), Polling, Operational
and Statistical Reports, Flow
Control, Programmable, IBM 2/3780,
IBM 3271
Diagnostic Resisters; Local

Diagnostic Features: Local Distribution Method: End user Price: \$75,000 Date First Installed: April 1978 Number Installed to Date: 500 -1,000 (See Vendor Profile Page V-20)

MULTI - TECH SYSTEMS, INC. MULTI-MUX Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels: Synchronous: 8

aynchronous. c Asynchronous: 1 Transmission Most Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous-Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 3,600 bps, 4,800 bps, 4,800 bps, 7,200 bps, 3,600 bps, 4,800 b

**Maximum Output Lines:** Asynchronous: 1 Output Transmission Mode: Full-Dunley **Output Line Transmission Rate** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control, Programmable, Point to Point. Multipoint Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1.295 Date First Installed: March 1983 (See Vendor Profile Page V-20)

**MULTI TRONICS** 

RDS-1800
Multiplexer Class: Concentrator input Interface: RS-232C
Maximum Input Channels: Synchronous: 16
Transmission Mode: Half-Duplex,

Synchronous: 16
Transmission Mode: Half-Duplex,
Full-Duplex, Echoplex
Input Transmission Rates:
Asynchronous - 300 bps, 600 bps,

1,200 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 96 bps

Maximum Output Lines: Synchronous: 19 Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex **Output Line Transmission Rates** Asynchronous - 300 bps. 600 bps. 1,200 bps. 4,800 bps. 9,600 bps Communications Protocols: Variable Link CRC16 Features: Downline Loading (On-Line Reconfiguration). Automatic Repeat Request, Polling, Port Contention, Switching, Flow Control, Programmable Diagnostic Features: Remote, Local Distribution Method: OEM Price: \$5,000 Date First installed: hine 1978 Number installed to Date: 100 - 500 (See Vendor Profile Page V-20)

MULTI TRONICS
SBR-700
Multiplexer Class: Concentrator
Input Interface: FSK Modern
Maximum Input Channels:

Synchronous: 1 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 1,200 bps Aggregate Transmission Rate: 12 bos

Maximum Output Lines: Synchronous: 1 **Output Transmission Mode: Half-**Duplex, Full-Duplex, Echoplex **Output Line Transmission Rates:** Asynchronous - 1,200 bps Communications Protocols Variable Link CRC16 Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control. Programmable Distribution Method: End user Price: \$1,000 Date First installed: June 1982 Number Installed to Date: 100 - 500

NETWORK PRODUCTS, INC. BABY MUX

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 19.200 Tranamission Mode: Full-Duplex Input Tranamisaion Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 134.5M bps Aggregate Tranamisaion Rate: 384

bps Output Transmission Mode: Full-Duplex Output Line Transmission Rates:

Asynchronous/Synchronous - 1,200 bps. 1,800 bps. 2,400 bps. 4,800 bps. 9,800 bps. 14,400 bps Communications Protocols: HDLC (CCITT X.205 Level-2) Features: Data Compression, Downline Loading (On-Line

Reconfiguration), Automatic Repeat Request, Flow Control, Programmable Biagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,350 to \$2,300 Date Pirst Installed: April 1982 Number Installed to Date: 500 -1,000 (See Vendor Profile Page V-21)

METWORK PRODUCTS, INC. BABY NET Multiplexer Class: Statistical

Input Interface: RS-232C, CCITT V.24/V.28 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps 4,800 bps, 7,200 bps, 9,600 bps

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Data Compression Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Switching, Operational, Statistical Reports, Flow Control. Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,450 to \$2,400 Date First Installed: December 1982 mber installed to Date: 100 - 500

NETWORK PRODUCTS, INC. LOCAL MUX Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels:

Synchronous: 8
Asynchronous: 8
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronous/Synchronous - 50
bps, 756 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,200 bps, 2,400
bps, 3,600 bps, 1,200 bps, 3,8,400
bps
Aggregate Transmission Rate:

3,072 bps Maximum Output Lines: Other: 1

1.000

Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous/Synchronous -937,500 bps 937,500 bps Peatures: Automatic Speed Delection (Autobaud), Transparent Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$350 Date First Installed: April 1983 Number Installed to Date: 500 - NORTHERN TELECOM
COMM-MULTIPLEXER
Multiplexer Class: Concentrator
input Interface: RS-232C
Maximum Input Channels:
Synchronous: 8
Synchronous: 8

Asynchronous: A Raynchronous Asynchronous Stransmission Rates: Asynchronous Synchronous - 110 bps, 300 bps, 800 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 2,400 bps, 2,600 bps, 2,900 bps, 2,90

Synchronous: 1
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous/Synchronous - 1,200
bps. 2,400 bps. 4,800 bps. 9,600

bps: Synchronous - 14,400 bps Communications Protocols: HDLC (CCITT X.25 Level 2), SDLC, CCITT X.25 (Level 3), BSC Features: Automatic Speed Detection (Autobaud), Protocol Conversion, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Programmable, Network Monitor, Auto Dialpy Diagnostic Features: Remote, Local Distribution Method: End user

Price: \$2,000
(See Vendor Profile Page V-22)

OPTELECOM, INC.

Multiplexer Class: Fiber-Optic TDM Input Interface: RS-232C Maximum Input Channels:

Synchronous: 4
Asynchronous: 4
Transmission Mode: Full-Duplex
Input Transmission Rates:
Synchronous: - Up to 153, 000 bps;
Asynchronous: - 100,000 bps
Aggregate: Transmission Rate:
98,000 bps
Maximum Output Lines:

Other: 1 Aggregate Output Line
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 9.8K bps
Communications Protocols: Optical

Intensity Modular Signal
Diagnostic Features: Remote
Distribution Method: End user, OEM
Price: \$1,100
Date First installed: March 1983
Number Installed to Date: 50
(See Vendor Profile Page V-22)

OPTELECOM, INC. 5100-8

Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 4

Asynchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,800 bps. 3,600 bps, 7,200 bps; Asynchronous/Sp,chronous - 38.4K bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 1.2K bps Output Transmission Mode: Fullbuplex Output Line Transmission Rates: Optical - 9,000 bps

Communications Protocols: All RS-232
Diagnostic Features: Remote Distribution Method: End user, OEM Price: \$6,000
Date First Installed: February 1982 Number Installed: Date: 100

PARADYNE CORP.

DCX-815 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8 Asynchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps. 75 bps. 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19.200 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Remote, Local Price: \$1,690 to \$2,180 Date First Installed: 1982 Number installed to Date: 500 -1 000 (See Vendor Profile Page V-23)

PARADYNE CORP.

DCX-825 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28, CCITT V23 V28 Maximum Input Channels:

Synchronous: 32 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps **Output Line Transmission Rates** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps nications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Remote, Local Price: \$3,200 to \$7,200 Date First Installed: September

Number installed to Date: 1,000

PARADYHE CORP. DCX-840 Multiplexer Class: Statistical Input Interface: V.35 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps 4,800 bps, 7,200 bps, 3,600 bps Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,800 bps, 4,400 bps, 1,920 bps, 5,600 bps, Asynchronous/Synchronous - 72,000 bps

Communications Protocola: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Remote, Local Price: \$10,000 to \$85,000 Date First Installed: 1932 Number Installed to Date: Under 100

PARADYNE CORP. DCX-850 Multiplexer Class: Statistical Input Interface: CCITT V.24/V.28, V.35

Maximum Input Channels: Synchronous: 240 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,700 bps, 9,600 bps 0,800 bps, 2,700 bps, 9,600 bps 0,900 bps, 4,800 bps, 9,600 bps 2,400 bps, 4,800 bps, 9,600 bps, 4,400 bps, 1,920 bps, 9,600 bps, 4,400 bps, 1,920 bps, 56,000 bps, Asynchronous/Synchronous - 72,000 bps

Opps Communications Protocols: HDLC Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Disgnestic Features: Remote, Local Price: \$15,000 to \$100,000 Date First Installed: 1982 Number Installed: 1982 Number Installed to Date: Under 100

PARADYNE CORP. DCX-861

Multiplexer Class: Statistical Input Interface: CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8 Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps **Output Line Transmission Rates:** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: HDLC Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration) Diagnostic Features: Rer Price: \$2,900 to \$3,300 Date First Installed: 1982

PARADYNE CORP.

Multiplexer Class: Statistical Input Interface: CCITT V.24/V.28 Maximum Input Channels: Synchronous: 32 Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,800 bps,
1,800 bps, 2,700 bps, 9,600 bps
Output Line Transmission Rates:
Synchronous - 1,200 bps, 1,800 bps
2,400 bps, 4,800 bps, 9,600 bps
Communications Protocols: HDLC
(CCITT X 205 Level 2)
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration)
Diagnostic Features: Remots, Local
Price: \$4,500 to \$8,800
Number Installed to Dete: 100 - 500

PARADYNE CORP. MP-14.4 SM Multiplexer Class: Statistical Input Interface: RS-232C, CCITT

V.24/V.28
Maximum Input Channels:
Synchronous: 16
Input Transmission Rates:

Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, Asynchronous/Synchronous - 1,200 to 12,000 bps Output Line Trenamisation Retes: Synchronous - 19,200 bps Features: Automatic Speed Detection (Autobaud)

Price: \$14,975 Date First Installed: 1983 PARADYNE CORP.

DCX-T1 Multiplexer Class: TDM Input Interface: CCITT V.35, 551A, 5-Wire

Maximum Input Channels: Synchronous: 48 Input Transmission Rates: Asynchronous - 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 44,800 bps 9,9chronous: 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps, 14,400 bps, 19,200 bps, 56,000 bps, 17:; Asynchronous/Synchronous 1.5M bps Features: Downline Loading (On-

Features: Downline Loading (C Line Reconfiguration) Price: \$8,000 to \$27,000 Date First installed: 1983

PARADYNE CORP. DCX-725

Multiplexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Asynchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 192 bps Maximum Outbut Lines:

Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates:
Synchronous - 1,200 bps. 1,800 bps.
2,400 bps. 4,800 bps. 9,500 bps.
1,400 bps. 1,9200 bps.
Communications Protecols: HDLC
(CCITT X.20 Level 2), SDLC, CCITY
X.25 (Level 3)
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request, Phytack
Suffering Deley, Flow Control
Diagnostic Features: Remote, Local
Distribution Method: End Lever

Price: \$4,000 Date First Installed: 1982 Number Installed to Date: Under 100

PERIPHONICS CORP.
VOICEPACK
Multiplexer Class: Voice Multiplexer

and Front End Processor Input Interface: RS-232C, CCITT V.24/V.26, Mil. 188C, Custom Protocols Maximum Input Channels:

Synchronous: 100
Asynchronous: 100
Transmission Mode: Half-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 300 bps, 1,200 bps

**Maximum Output Lines:** Other: Configuation Dependent **Output Transmission Mode: Half-**Duplex, Full-Duplex Features: Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration). Automatic Repeat Request, Flyback Buffering Delay, Polling, Port Contention, Switching, Operational and Statistical Reports Flow Control, Network Monitor, Voice/Data Front End Peripherals Diagnostic Features: Remote Distribution Method: End user, OEM Price: \$20,000 Date First installed: January 1974 Number installed to Date: Under

100 (See Vendor Profile Page V-23)

PERIPHONICS CORP. T-COMM

Multiplexer Class: Voice Multiplexer Input Interface: RS-232C, CCITT V.24/V.28, MIL 188C, Custom Protocols Maximum Input Channels:

Synchronous: 416
Asynchronous: 416
Transmission Mode: Full-Duplex
Input Transmission Raties:
Asynchronous-Synchronous-50
bps, 75 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,800 bps, 2,400
bps, 3,600 bps, 1,800 bps, 7,200
bps, 9,600 bps, 4,900 bps, 7,200
bps, 9,600 bps; Asynchronous19,200 bps
Maximum Output Lines:

Other: Dependent
Output Transmission Mode: HalfDuplex, Full-Duplex
Communications Protocols: Vendor
Dependent
Features: Data Compression,
Protocol Conversion, Downline

Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Nerwork Monitor Diagnostic Peatures: Remote Distribution Method: End user, OEM

Price: \$35,000
Date First Installed: January 1970
Number Installed to Date: 100 - 500

PERIPHONICS CORP.
VOICE STAR
Multiplexer Claes: Voice Multiplexer
and Front End Processor
Input Interface: RS-232C, CCITT

V 24/V 28, MIL 188C, Custom Protocols Maximum Input Channels: Synchronous: 416 Asynchronous: 416 Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps,

1,800 bps, 3,600 bps, 7,200 bps, 19,200 bps; Asynchronous/Synchronous - 2,400 bps, 4,800 bps, 9,600 bps

Maximum Output Lines:
Other: Dependent
Output Transmission Mode: HalfDuplex, Full-Duplex
Communications Protocols: Vendor
Dependent
Features: Data Compression,
Protocol Conversion, Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request, Polling,
Port Contention, Swirching,
Operational and Statistical Reports,

Flow Control, Programmable, Network Monitor Diagnostic Features: Remote Distribution Method: End user, OEM

Price: \$35,000 Date First Installed: January 1970 Number Installed to Date: 100 - 500

PHALO CORP.

MD-3200
Multiplexer Class: TDM
Input Interface: IBM 3274 Control
Terminal
Transmission Mode: Half-Duplex
Input Transmission Rates:
Asynchronous/Synchronous - 2.36M

Maximum Output Lines: Synchronous: 1 Features: 3274 Terminal to Controller Disgnostic Features: Remote, Local Distribution Method: End user, OEM Price: \$2,740 to \$4,750 Date First Installed: April 1983 (See Vendor Profile Page 1-23)

PHALO CORP. MD-3208

Multiplexer Class: TDM Input Interface: IBM 3274 Control Terminal Transmission Mode: Helf-Duplex Input Transmission Rates: Asynchronous/Synchronous - 2.36M bps Maximum Output Lines:

Other: 1 Optical or Coaxial **Output Transmission Mode: Half-**Duplex Output Line Transmission Rates: Asynchronous/Synchronous -Proprietary Communications Protocols: IBM Features: 3274 Terminal to Controller Diagnostic Features: No Distribution Method: End user, OEM Price: \$875 **Date First Installed: September** 1983

Multiplayer Class TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 24 Asynchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 4.600 bps

PHALO CORP.

OMX-1908

Maximum Output Lines: Other: Optical Link Output Transmission Mode: Full-Duolex Output Transmission Rate: 6.9M bps Features: Speed and Protocol Transparent Diagnostic Features: No Distribution Method: End user Drine: \$1 205 Date First Installed: July 1983

PHALO CORP. OMX-1916 Multiplexer Class: TDM Input Interface: RS-232C Maximum Input Channels: Synchronous: 48

Asynchronous: 16

Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 9,210 bps Output Transmission Mode: Full-**Output Transmission Rate: 6.9M** bas Features: Speed and Protocol Transparent Diagnostic Features: No Distribution Method: End user

PHALO CORP. OMX-5600 Multiplexer Class: TDM Input Interface: RS-232C. MIL. 188C, RS-449, V.35 Maximum Input Channels:

Date First Installed: July 1983

Price: \$2,395

Synchronous: 64 Asynchronous: 64 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 hos 3,600 hos 4,800 hos 7,200 bos, 9,600 bos, 19,200 bos Aggregate Transmission Rate 9.210 bos Output Transmission Mode: Full-Duplex

**Output Line Transmission Rates**: Asynchronous/Synchronous - 8M hns

Features: Protocol and Speed Transparent Diagnostic Features: Local Distribution Method: End user, OEM Price: \$6,000 to \$18,800 **Date First Installed: September** 

**Multiplexer Class: TDM** Input Interface: BS-232C, Mil. 188C, RS-449, V.35 Maximum Input Chan Synchronous: 64 Asynchronous: 64 Transmission Mode: Full-Duplex

PHALO CORP.

Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 5,000 bps Maximum Output Lines: Other: 2 Optical

Output Transmission Mode: Full-Duolex **Output Line Transmission Rates:** Asynchronous - 8M bps Features: Protocol and Speed Transparent Diagnostic Features: Remote, Local Distribution Method: End user, OEM Price: \$3,300 to \$16,000 **Date First Installed: September** 

PHILIPS ELECTRONIC INSTRUMENTS FLEXPAC PAD Input Interface: RS-232C, CCITT V 24/V 28

**Maximum Input Channels:** Asynchronous: 15 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bos. 75 bos. 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Maximum Output Lines:

Synchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates** Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, 19,200 bps cations Protocols: HDLC (CCITT X.25 Level 2), CCITT X.25 (Level 3) Features: Automatic Speed Detection, Downline Loading (On-Line Reconfiguration), Port

Contention, Switching, Operational

and Statistical Reports, Flow Control, Programmable, Network Diagnostic Features: Remote, Local Distribution Method: End user

Third-party Number Installed to Date: 500 -(See Vendor Profile Page V-23)

PHOENIX DIGITAL CORP. BABY KNET Multiplexer Class: Statistical Input Interface: RS-232C, CCITT

nission Mode: Full-Duplex input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Trensmission Rate: 1,152 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transr

Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level-2) Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,450 to \$2,400 Date First Installed: December 1982 Number Installed to Date: 100 - 500 (See Vendor Profile Page V-23)

PHOENIX DIGITAL CORP. DPAC/PTX-1 Multiplexer Class: TDM Input Interface: RS-232C, RS-422, CCITT V.24/V.28, 20 mA and 60 mA Current Loop, HDLC Maximum Input Chan

Synchronous: 16 Asynchronous: 16 mission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Retail Synchronous - 50 bps, 75 bps; Asynchronous/Synchronous bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Aggregate Transmission Rate: 10,000 bps **Maximum Output Lines:** Synchronous: 16

Asynchronous: 16 **Output Transmission Mode: Half-**Duplex, Full-Duplex, Echoplex **Output Line Transmission Rates** Synchronous - 1,200 bps, 1,800 bps, 2.400 bps. 4.800 bps. 9,600 bps. 14,400 bps, 19,200 bps, 56,000 bps nications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT

X 25 (Level 3) April Ontonet Features: Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration). Automatic Repeat Request Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control. Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: OEM Price: \$7,000 to \$12,000 Date First Installed: July 1982 Number Installed to Date: Under

PHOENIX DIGITAL CORP. DPAC-30 Input Interface: RS-232C, RS-422, CCITT V.24/V.28, 20 mA and 60 mA Current Loop

Maximum Input Channe Synchronous: 16 Asynchronous: 16 Transmission Mode: Hatf-Dunley. Full-Duplex, Echopiex input Transmission Rat Synchronous - 50 bps, 75 bps; Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps. 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 10,000 bos Maximum Output Lines:

Synchronous: 16 Asynchronous: 16 Output Transmission Mode: Half-Duplex, Full-Duplex, Echopiex **Output Line Transmission Rates:** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT X.25 (Level 3), Ascii, Optonet Features: Data Compression, Protocol Conversion, Downline Loading (On-Line Reconfiguration) Automatic Repeat Request, Flyback Buffering Delay, Polling, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: OEM Price: \$5,000 to \$9,000 Number Installed to Date: Under

PRENTICE CORP.

SNP 1101 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 1 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps, Aggregate Transmission Rate: 192

**Maximum Output Lines:** Asynchronous: 1

Output Transmission Mode: Full-Duniex

Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Communications Protocols: HDLG Modified

Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control

Disgnostic Features: Remote Distribution Method: Third-party Price: \$695

Date First Installed: April 1981 Number Installed to Date: 100 - 500 (See Vendor Profile Page V-24)

### PRENTICE CORP.

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 2 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps,

4,800 bps, 9,600 bps Aggregate Transmission Rate: 192 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-

Duplex
Output Line Transmission Rates:
Synchronous - 1,200 bps, 1,800 bps,
2,400 bps, 4,800 bps, 9,600 bps;
Asynchronous/Synchronous - 1,200
bps to 9,800 bps
Communications Protocols:
Modified HDLC

Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control

Diagnostic Features: Remote Distribution Method: End user, Third-party

Price: \$895 Date First Installed: April 1981 Number installed to Date: 100 - 500

#### PRENTICE CORP. SNP 1104

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 4
Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous - 110 bps, 150 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps
Aggregate Transmission Rate: 192 bps

Maximum Output Lines: Asynchronous: 1

Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps; 2,400 bps, 4,800 bps, 9,600 bps; Asynchronous/Synchronous - 1,200 bps to 9,600 bps Communications Protocols: Modified HDLC Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control

Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1,295 Date First Installed: October 1981 Number Installed to Date: 500

#### PRENTICE CORP.

SNP 1208 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 8 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 110 bps, 150 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Maximum Output Lines:

Asynchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Transmission Rate** Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps; Asynchronous/Synchronous - 1,200 bps to 9,600 bps Communications Protocols: Modified HDLC Features: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Polling, Flow Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$1.495 to \$2.295 Date First Installed: August 1982 Number Installed to Date: 100 - 500

PRENTICE CORP.
SNP 1209
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24/V.28
Maximum Input Channels:

Synchronous: 8
Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous-110 bps, 150 bps, 300 bps: 8,900 bps: 4,800 bps. 4,800 bps. 4,800 bps. 4,800 bps. 5,900 bps. 5,900 bps. 5,900 bps. 3,800 bps. 7,200 bps

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps,

2,400 bps, 4,800 bps, 9,600 bps; Asynchronous/Synchronous - 1,200 to 9,600 bps Communications Protocols: Modified HDLC Features: Automatic Speed Detection (Autobaud), Downline

Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flow Control Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$2,095 to \$2,795 Date First installed: November 1983 Number Installed to Date: Under 100

#### RACAL-MILGO, INC.

CMIMUX 80 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 8 Asynchronous: 8 Asynchronous: 4 Full-Duplex, Echoplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps to 9,600 bps Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Asynchronous: 2
Output Transmission Mode: HalfDuplex, Full-Duplex, Edhoplex
Output Transmission Mode: HalfDuplex, Full-Duplex, Edhoplex
Output Line Transmission Rates:
Asynchronous/Synchronous - Up to
19,200 bps
Communications Protocols: HDLC
(CGITT X.205 Level 2), Modified
Synchronous Input Protocol
Synchronous Input Protocol
Features: Downline Loading (OnLine Reconfiguration),
Programmable, Natwork Monitor,
Speed Conversion
Disgnostic Features: Remote, Local
Distribution Method: End user
(See Vendor Profile Page V-24)

#### RACAL-MILGO, INC.

OMNIMUX 30 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 8 Transmission Mode: Half-Duplex Input Transmission Rates: Asynchronous: 50 bps, 75 bps, 110 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 96

Maximum Output Lines: Synchronous: 8 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Asynchronous - 4,800 bps, 9,600

bps
Communications Protocols: HDLC
(CCITT X.205 Level 2), Modified HalfDuplex
Features: Downline Loading (On-

Line Reconfiguration.), Network Monitor, Aggregate and Channel Loopback Distribution Method: End user

Price: \$1,800 to \$2,600

#### RACAL-MILGO, INC. OMNIMUX 40

Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps,

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Aggregate Transmission Rate: 96 bps

Maximum Output Lines: Synchronous: 8 Output Line Transmission Rates: Asynchronous/Synchronous - Up to 9,600 bps

Modified HDLC (CCITT X.205 Level 2)

Feetures: Automatic Speed
Detection (Autobaud), Flyback
Buffering Delay, Programmable,
Network Monitor, Autobaud and
Flow Control Optional
Diagnostic Feetures: Remote, Local
Distribution Method: End user
Price: \$1,800 to \$2,800

RACAL-MILGO, INC.

OMNIMUX 160 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Symchronous: 16 Asynchronous: 16 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Symchronous - 50 ps to 9,600 bps Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Output Line Transmission Rates: Asynchronous/Synchronous - Up to 19,200 bps

Communications Protocols: Modified HDLC (CCITT X.205 Level

 Peatures: Downline Loading (On-Line Reconfiguration), Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user

#### RACAL-MILGO, INC.

OMNIMUX 320
Multiplexer Class: Statistical input Interface: RS-232C, CCITT V.24/V.28
Maximum input Channels:

Maximum Input Channels: Synchronous: 32 Asynchronous: 8 Transmission Mode: Half-Duplex, Full-Duplex, Echopiex Input Transmission Rates: Synchronous - 50 to 9,600 bps Aggregate Transmission Rate: 192

bps Maximum Output Lines:

Asynchronous: 2
Output Line Transmission Rates:
Asynchronous/Synchronous - Up to 19,200 bps
Communications Protocols:
Modified HDLC (CCITT X.205 Level

Features: Downline Loading (On-Line Reconfiguration), Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local

RACAL-VADIC SCOTSMAN III Multiplexer Class: Network Concentrator Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 4 Asynchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates Asynchronous - 75 bps, 110 bps 300 bps 600 bps 9,600 bps: Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 7,200 bps; Synchronous - 19,200 bps Aggregate Transmission Rate: 192 bos **Output Line Transmission Rates**: Asynchronous - 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2), SDLC, CCITT X.25 (Level 3), BSC, Ascii Features: Data Compression. Protocol Conversion Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Network Monitor Diagnostic Features: Remote, Local Date First Installed: December 1983 Number installed to Date: Under

(See Vendor Profile Page V-25)

100

RACAL-VADIC SCOTSMAN I Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8
Asynchronous: 8
Transmission Mode: Half-Duplex,
Fall-Duplex
Inguit Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 150 bps, 300 bps, 600 bps;
Asynchronous/Synchronous - 1,200
bps, 1,800 bps, 2,400 bps, 4,800
bps, 9,600 bps; Synchronous - 3,600
bps, 7,600 bps, 7,600
bps, 7,600

Aggregate Transmission Rate: 96 bps Cutput Transmission Mode:

Echopiex
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Automatic Repeat Request, Flow
Control
Distribution Method: End user

Price: \$1,850 Date First Installed: July 1983 Number Installed to Date: Under 100

RACAL-VADIC SCOTSMAN II Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 8
Asynchronous: 8
Transmission Mode: Half-Duplex,
Full-Duplex
Input Transmission Rates:

Asynchronous - 50 bps, 75 bps, 110 bps, 134 bps, 150 bps, 200 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps Aggregate Transmission Rate: 768 bps

Maximum Output Lines: Asynchronous: 1 Output Line Transmission Rates: Synchronous - 1,200 bps. 1,800 bps, 2,400 bps. 4,800 bps, 9,600 bps, 14,400 bps. 4,800 bps, 10,400 bps, Hostinission Protocola: Modified HDLC Pestures: Automatic Speed Detection (Autobaud), Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Switching, Operational and Statistical Reports, Flow Control, Network Monitor

Monitor Diagnostic Features: Remote, Local Diagnostic Features: Remote, Local Diagnostic Features: Remote Price: \$2,950 to \$4,900 Number Installed to Date: Under 100

RIANDA ELECTRONICS MODEL 1600 Multiplezer Class: TDM Input Interface: RS-232C Maximum Input Channels; Synchronous: 16

Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 1,800 bps, 2,400 bps, 3,600 bps, 1,800 bps, 7,200 bps, 9,600 bps, 19,200 bps
Aggregate Transmission Rate: 3,072 bps
Maximum Output Lines:

Synchronous: 16
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 14,400 bps
Communications Protocols: CCITT
V.24
Feetures: Polling, Port Contention

Diagnostic Features: Local Distribution Method: OEM Price: \$360 to \$1,900 Date First Installed: January 1979 Number Installed to Date: Under 100 (See Vendor Profile Page V-25)

RIANDA ELECTRONICS MODEL 2600 Multiplexer Class: TDM Input Interface: RS-232C

Maximum Input Channels: Synchronous: 16 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous: 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Aggregate Transmission Rate: 3,072 bps Output Transmission Mode: Full-Duplex Output Line Transmission Rates

Output Line Transmission Rates: Asynchronous - 14,400 bps Communications Protocols: 20 mA Current Loop
Peatures: Polling, Port Contention,
Parallel Print Port, Masterity
Diagnostic Features: Local
Distribution Method: OEM
Price: \$900 to \$1,440
Date First Installed: January 1977
Number Installed to Date: 100 - 500

RIXOM, ING.
DCX840 NETWORK MUX
Multiplexer Class: Network
Concentrator
Input Interface: RS-232C, CCITT
V.24/V.24

Maximum Input Channels: Synchronous: 240 Input Transmission Rates: Asynchronous -75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384 bps

**Maximum Output Lines:** 

Asynchronous: 15
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 1,200 bps, 1,800 bps,
2,400 bps, 4,800 bps, 5,600 bps;
14,400 bps, 19,200 bps, 56,000 bps;
4,400 bps, 19,200 bps, 56,000 bps;
Communications Protocols: HDLC

(CCITT X.205 Level 2)
Features: Automatic Speed
Detection (Autobaud), Downline
Loading (On-Line Reconfiguration),
Flyback Buffering Delay, Flow
Control
Disconsitic Features: Local

Diagnostic Features: Local (See Vendor Profile Page V-25)

PIXON, INC. DCX850 SWITCHING MUX Multiplexer Class: Network Concentrator Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Synchronous: 240 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384

Asynchronous: 14
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 1,200 bps. 1,800 bps.
2,400 bps. 4,800 bps. 1,800 bps.
14,400 bps. 19,200 bps. 50,000 bps;
Asynchronous/Synchronous - 72,000
bps
Communications Protocols: HDLC
(CCITT X.205 Level 2)

Maximum Output Lines:

(CCITT X.205 Level 2)
Features: Data Compression,
Downline Loading (On-Line
Reconfiguration), Flyback Buffering
Delay, Port Contention, Switching,
Flow Control
Diagnostic Features: Local

Price: \$80,000

COMMUX STATISTICAL
MULTIPLEXER PLUS
Multiplexer Class: Statistical
Input interface: RIS-232C, CCTT
V24V/28
Maximum Input Channels:
Synchronous: 8
Transmission Mode: Full-Duplex,
Echoplex
Input Transmission Rates:
Asynchronous - 75 bos. 110 bps.

300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,600 bps, 7,200 bps, 9,600 bps
Aggregate Transmission Rate: 384 bps
Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 4,800 bps
Communications Protocols: HDLC
(CCITT X.205 Level 2)
Features: Automatic Speed
Detection (Autobaud), Flyback
Buffering Delay
Diagnostic Features: Local
Distribution Method: End user

FIXON, IMC.
DOBUSTS STATISTICAL
MULTIPLEXER
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24V.28
Maximum Input Channels:

Synchronous: 8
Transmission Mode: Full-Duplex, Echoplex
Input Transmission Rates:

Input Transmission Rates: Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384

Aggregate Transmission Rate: 38 bps Maximum Output Lines:

Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 1,200 bps, 14,400
bps

Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Data Compression, Flyback Buffering Delay, Buffer Overload Protection Diagnostic Features: Local

RIXON, IHC. DCX825 STATISTICAL MULTIPLEXER Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

Synchronous: 32
Asynchronous: 4
Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,800 bps, 3,600 bps;
Asynchronous/Synchronous - 1,200

bos. 2.400 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 768

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex

**Output Line Transmission Rates:** Synchronous - 1,200 bps, 2,400 bps. 4,800 bps, 9,600 bps, 14,400 bps; Asynchronous/Synchronous - 3,600 bos

nications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Flyback Buffering Delay
Diagnostic Features: Local

RIXON, INC. DCX836 STATISTICAL Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 **Maximum Input Channels** Synchronous: 60 Transmission Mode: Half-Duplex.

Full-Duplex, Echopiex Input Transmission Rates Asynchronous - 75 bps, 110 bps 300 bps, 600 bps, 1,200 bps, 1,800 bos. 2:400 bos. 3.600 bos. 4.800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex

Output Line Transmission Rates: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps, 19,200 bps, 56,000 bps; Asynchronous/Synchronous - 72,000 bps

unications Protocols: HDLC Features: Automatic Speed Detection, Downline Loading (On-Line Reconfiguration), Flyback Buffering Delay, Flow Control Disgnostic Festures: Local

RIXON, INC. DCX725 SYNCHRONOUS MULTIPLEXER lexer Class: TDM Input Interface: RS-232C, CCITT V.24/V.28

Maximum Input Channels: Asynchronous: 4 ansmission Mode: Full-Duplex, Echoplex Input Transmission Rates: Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 192

bos ximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex

Output Line Transn Synchronous - 4,800 bps, 9,600 bps, 14 400 hns 19 200 hns: Asynchronous/Synchronous - 7,200

unications Protocols: HDLC

Festures: Data Compression Switching Diagnostic Features: Local

BOCKWELL INTERNATIONAL DXM-2003

Multiplexer Class: TDM Input Interface: DS1 Maximum Input Channels:

Asynchronous: 28 Transmission Mode: Full-Duplex Input Transmission Rates: T-1 Aggregate Transmission Rate: 44.7M bps

Maximum Output Lines Asynchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** 44.7M bps Communications Protocols: B325 Features: Automatic Speed Detection (Autobaud), Programmable, 75 Watts of Power Distribution Method: Fnd user Price: \$18,000 Date First Installed: November 1983 Number Installed to Date: Under 500

(See Vendor Profile Page V-25)

SCITEC CORP. CPY 95 Multiplexer Class: Statistical Input Interface: RS-232C **Maximum Input Channels** 

Synchronous: 32 Asynchronous: 32 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps; Asynchronous -19,200 bps Aggregate Transmission Rate: 788 Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Synchronous - 2,400 bps, 56,000 unications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Programmable Diagnostic Features: Local Distribution Method: End user, OEM Price: \$1,850 to \$10,000 (See Vendor Profile Page V-26)

SCITEC CORP.

Multiplexer Class: Statistical input interface: RS-232C Maximum Input Channels: Synchronous: 32

Asynchronous: 32 Transmission Mode: Half-Duplex. Full-Duplex, Echoplex Input Transmission Rates:

Asynchronous/Synchronous - 50 bos. 75 bos. 110 bos. 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps; Asynchronous -19 200 bps Aggregate Transmission Rate: 788

Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Full-**Output Line Transmission Rates:** Synchronous - 2,400 bps, 56,000 bos

unications Protocols: HDLC (CCITT X.205 Level 2) Fastures: Automatic Spr Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Programmable Diagnostic Features: Local
Distribution Method: Fnd user, OFM Price: \$4,500 to \$10,000

SCITEC CORP. MUX 25 Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels

Synchronous: 4 Transmission Mode: Full-Duplex. Echoplex Input Transmission Rate Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 384

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-

Duplex **Output Line Transmission Rates:** Synchronous - 1,200 bps, 9,600 bps Communications Protocols: HDLC (CCITT X.205 Level 2) Features: Automatic Spi Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Flyback Buffering Delay, Flow Control, Programmable

Diagnostic Features: Local Distribution Method: End user, Third-party

Date First Installed: January 1978 Number Installed to Date: 100 - 500

NPX Multiplexer Class: Statistical Input Interface: RS-232C Maximum Input Channels:

SCITEC CORP.

19,200 bps

Synchronous: 32 Asynchronous: 32 namission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7200 bps, 9,600 bps; Asynchronous

Aggregate Transmission Rate: 788 Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 2,400 bps, 56,000

cations Protocols: HDLC Features: Automatic Speed Detection (Autobaud), Data Compression, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Flow Control, Programmable Diagnostic Features: Local Distribution Method: End user, OEM Price: \$4,500 to \$10,000 Number installed to Date: Under 100

SCITEC CORP.

ESPT1 Multiplexer Class: TDM Input Interface: RS-232C, RS-449 Maximum Input Channels:

Asynchronous: 128
Transmission Mode: Full-Duplex
Input Transmission Rates: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 14,400 bps, 19.200 bps; Asynchronous/Synchronous - 256K

bps **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** 

Synchronous - T-1
Communications Protocols: T-1
Features: Downline Loading (On-Line Reconfiguration), Programmable, Voice Diagnostic Features: Local Distribution Method: End user, OEM Price: \$3,900 to \$35,000 Date First Installed: March 1983 Number Installed to Date: Under

SIERRA RESEARCH CORP.

TC-2/32 Multiplexer Class: Cable Input Interface: RS-232C Maximum input Channels:

Synchronous: 80 Transmission Mode: Full-Duplex Input Transmission Rates Asynchronous - 9,600 bps Maximum Output Lines: Synchronous: 1

Asynchronous: 1 Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Asynchronous/Synchronous - 9,600 bps Communications Protocols:

Custom Features: Protocol Conversion, Downline Loading (On-Line Reconfiguration), Polling, Flow Control

Diagnostic Features: Local Distribution Method: End user. OEM, Third-party Price: \$10,000

# Multiplexers

Date First Installed: January 1982 Number Installed to Date: Under 100 (See Vendor Profile Page V-26)

SPERRY CORP.
SIXTEEN CHANNEL TERMINAL
MULTIPLEXER
Multiplexer Class: Scan for Channel
Recuest

Input Interface: RS-232C, CCITT V.24/V.28 Transmission Mode: Helf-Duplex.

Input Transmission Rates: Synchronous - 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Aggregate Transmission Rate: 192

bps Maximum Output Lines:

Full-Dunley

Asynchronous: 16 **Output Transmission Mode: Half-**Duplex, Full-Duplex **Output Line Transmission Rates:** Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 14,400 bps Communications Protocols: Transparent Features: Polling Diagnostic Features: Remote, Local Distribution Method: End user Price: \$2.138 Date First Installed: April 1981 Number Installed to Date: 1,000 -5.000 (See Vendor Profile Page V-28)

TAMBY CORP.
COMMUNICATIONS MULTIPLEXER
(71-3000)
Multiplexer Class: Concentrator
Input Interface: RS-232C
Transmission Mode: Full-Duplex
Input Transmission Retes:
Asynchronous - 9,600 bps
Blazimum Output Lineas:

Synchronous: 16
Cutput Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 300 bps
Communications Protocols: Ascii
Festures: Downline Loading (OnLine Reconfiguration), Polling, Port
Contention, Programmable, Network
Monitor
Diagnostic Festures: Local
Disgribution Method: End user

Price: \$6,000 to \$8,000
Date First Installed: February 1980
Number Installed to Date: Under
100

(See Vendor Profile Page V-29)

TAU-TROU, INC. INTRAPLEX T.D.M. 150 Multiplexer Class: TDM Input Interface: RS-232C, RS-449 Maximum Input Channels:

Synchronous: 240
Asynchronous: 240
Transmission Mode: Full-Duplex Input Transmission Rates:
Asynchronous/Synchronous - 110
bps
Aggregate Transmission Rate:
1.3M bps
Maximum Output Lines:

Asynchronous: 1
Asynchronous: 1
Asynchronous: 1
Asynchronous: 1.5M
bps
Communications Protocols:
Transparent to Protocol
Features: Polling, Switching,
Programmable
Diagnostic Features: Local
Distribution Method: End user
Price: \$3.500 to \$6.000
Date First installed: July 1983
Gee Vendor Profile Plage V-29)

**TELEPROCESSING** 

PRODUCTS, INC.

Multiplexer Clase: Statistical Input Interface: RS-232C Mazimum Input Channels: Synchronous: 2 Asynchronous: 2 Asynchronous: 2 Transmission Mode: Half-Duplex, Full-Duplex, Ectoplex Input Transmission Rates: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 1,200 bps, 1,800 bps, 7,200 bps, 9,600 bps, 9,600 bps, 9,600 bps, 9,600 bps, 9,600 bps, 7,200 bps, 9,600 bps Pransmission Rate: 192

Meximum Output Lines:
Asynchronous: 1
Output Transmission Mode: FullDuplex
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 9,800 bps
Communications Protocols: Asci
Features: Automatic Repeat
Request, Fryback Buffering Delay
Diagnostic Features: No
Distribution Method: End user,
Third-party
Price: 8550
Date First Installed: June 1981
Number Installed: June 1981
Number Installed: Date: 100 - 500
(See Vendor Profile Page +230)

TELEPROCESSING PRODUCTS, INC. TP-214 Multiplexer Class: Statistical Input Interface: RS-232C

Maximum Input Channels: Asynchronous: 4 Transmission Mode: Half-Duplex, Full-Duplex, Echoplex Input Transmission Rates: Asynchronous: 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,800 bps

Aggregate Transmission Rate: 192 bps Maximum Output Lines:

Asynchronous: 1
Output Trensmission Mode: FullDuplex
Output Ine Trensmission Retes:
Synchronous - 9,800 bps
Communications Protocols: Ascii
Features: Programmable, Automatic
Repeat Request, Flyback Buffering
Delay
Dietribution Method: End user,
Third-party
Price: \$1,350
Date First Installed: January 1984

Number installed to Date: Under

TELLABS, INC. 331 XPLEXER Multiplexer Class: Concentrator,

TELEPROCESSING
PRODUCTS, INC.
TP-400 MULTI-DROP STAT MUX
Multiplexer Class: Statistical
input interface: RS-232C
Maximum input Channels:

Synchronous: 32
Transmission Mode: Half-Duplex, Foli-Duplex, Echoplex Input Transmission Retes: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bpc, 7,200 bps, 9,600 bps
Aggregate Transmission Rete:

Maximum Output Lines: Asynchronous: 1 Output Transmission Mode: Full-Duplex

Output Line Transmission Retes:
Synchronous - 9,800 bps
Communications Proteocle: / soil
Features: Data Compression,
Downline Loading (On-Line
Reconfiguration), Automatic Repeat
Request: Pylack Buffering Delay,
Polling, Port Contention, Operational
and Statistical Reports, Flow
Control, Network Monitor
Diagnostic Features: Local
Distribution Method: End user,
Third-party
Price: \$4,000 to \$2,500
Date First Installed: June 1981
Number Installed: to Date: 100 - 500

TELLABS, INC.
330A-F DATAPLEXERS
Multiplexer Class: Statistical
Input Interface: RS-232C, CCITT
V.24/V.28
Maximum Input Channels:

Synchronious: 32
Asynchronious: 81
Asynchronious: 8
Transmission Mode: Full-Duplex
Input Transmission Rates:
Asynchronious - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 4,800 bps,
9,600 bps
Aggregate Transmission Rate:
3,072 bps
Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 1,200 bps Asynchronous/Synchronous - 76.8K bps

Communications Protocols: CCITT X.25 Level 2 Features: Automatic Speed Detection, Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Operational and

Programmable, Network Monitor
Diagnostic Features: Remote, Local
Price: \$2,400 to \$11,900
Date First Installed: 1982
Number Installed to Date: Under
100
(See Vendor Profile Page V-30)

Statistical Reports, Flow Control.

Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels: Synchronous: 32

Data Switching

Symchronous: 32
Asymchronous: 8
Asymchronous: 8
Transmission Moder Full-Duplex
Input Transmission Rates:
Asymchronous: 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1200 bps,
1,800 bps, 2,400 bps, 4,800 bps,
9,600 bps
Aggregate Transmission Rate:
3,072 bps
Maximum Output Lines:
Asynchronous: 18
Asynchronous: 18

Asynchronous: 18 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 1,200 bps; Asynchronous/Synchronous - Up to 76.8K bps is Protocols: Subset of CCITT X.25 Level 2 Features: Automatic Speed Detection (Autobaud), Automatic Repeat Request, Port Contention. Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor, Flexible Network Topology Diagnostic Features: Remote, Local Distribution Method: End user. Third-party Price: \$2,900 to \$12,900 Date First Installed: 1983

TELMAC, INC.
AMUX-1
Multiplexer Class: TDM
Input Interface: RS-232C
Maximum Input Channels:
Synchronous: 4

Maximum Input Channels: Synchronous: 4 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous: 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps Aggregate Transmission Rate: 192 bps

Maximum Output Lines:
Synchronous: 4
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Asynchronous - 1,200 bps, 2,400
bps, 4,800 bps, 2,400
bps, 4,800 bps
Communications Protocols: Ascii
Disgnostic Features: Local
Distribution Method: End user
Price: \$800
Date First Installed: January 1981
Number Inetalled to Date: Under
100
(See Vendor Profile Page V-30)

TELTONE CORP.

M-860 Multiplexer Class: Statistical Input Interface: RS-232C, CCITT V.24/V.28 Maximum Input Channels:

Synchronous: 32 Transmission Mode: Full-Duplex, Echopiex Input Transmission Rates: Asynchronous - 300 bps, 600 bps; Synchronous - 9,600 bps Aggregate Transmission Rate: 3,072 bps Maximum Output Lines:

Asynchronous: 2 Output Line Transmission Rates: Asynchronous/Synchronous - 76,800

bps
Communications Protocoles: HDLC,
SDLC, Subset of CCITT X.25 Level 2
Features: Automatic Speed
Detection (Autobaud), Protocol
Conversion, Downline Loading (OnLine Reconfiguration), Automatic
Repeat Request, Phyback Buffering
Delay, Polling, Operational and
Statistical Reports, Programmable
Diagnostic Features: Remote, Local
Disgnostic Features: Remote, Local
Disgnostic Features: July 1983
Number Installed: July 1983
Number Installed: Date: Under
100
(See Veinder Profile Repe V-30)

TIMEPLEX, INC. NETWORKING MICROPLEXER

NM96 Multiplexer Class: Statistical Input Interface: RS-232C, RS-422, CCITT V.24/V.28, MIL 188C Maximum Input Channels: Synchronous: 96

Synchronous: 96
Asynchronous: 96
Transmission Mode: Half-Duplex,
Full-Duplex

Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 9,216 bps Maximum Output Lines:

Asynchronous: 6
Output Transmission Mode: FullDuplex
Output Line Transmission Returns

Output Line Transmission Rates: Synchronous - 14,400 bgs Communications Protocols: HDLC Feetures: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable,

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$17,000 Date First Installed: 1983 (See Vendor Profile Page V-31)

TIMEPLEX, INC. NETWORKING MICROPLEXER NM144

Multiplexer Class: Statistical Input Interface: RS-232C, RS-422, CCITT V.24/V.28, MIL 188C Maximum Input Channels:

Synchronous: 144
Asynchronous: 144
Transmission Mode: Half-Duplex,
Full-Duplex
Input Transmission Rates:

Asynchronous - Up to 9,600 bps Aggregate Transmission Rate: 13,800 bps Maximum Output Lines:

Asynchronous: 6
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:

Synchronous - 14,400 bps Communications Protocols: HDLC Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$17,000 Date First Installed: 1983

TIMEPLEX, INC. QUAD SWITCHING MICROPLEXER

Multiplexer Class: Statistical Input Interface: RS-232C, RS-422, CCITT V.24/V.28, MIL 188C Maximum Input Channels:

Synchronous: 48

Asynchronous: 48
Transmission Mode: Half-Duplex,
Full-Duplex
Input Transmission Rates:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps
4,800 bps, 7,200 bps, 9,600 bps
Aggregate Transmission Rate:
4,608 bps

Maximum Output Lines:
Asynchronous: 4
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous: 14,400 bps
Communications Proteocles: HDLC
Features: Downline Loading (OnLine Reconfiguration), Automatic
Repeat Request, Flyback Buffering
Delay, Port Contention, Switching,
Operational and Statistical Reports,
Flow Control, Programmable

Diagnostic Features: Remote, Local Distribution Method: End user Price: \$7,525 Date First Installed: 1983

Network Monitor

TIMEPLEX, INC.
SERIES II MICROPLEXER M8
Multiplexer Class: Statistical
Input Interface: RS-232C, RS-422,
CCITT V.24/V.28, MIL 188C
Maximum Input Channels:
Synchronous: 8

Asynchronous: 8 Transmission Mode: Half-Dupiex, Full-Dupiex, Input Transmission Retes: Asynchronous/Synchronous - 50 bps, 75 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 768

Aggregate transmission Hare: /oc bps Maximum Output Lines: Asynchronous: 2 Output Transmission Mode: Full-Duplox Output Line Transmission Rates: Synchronous - 9,000 pps, 14,400 bps, 19,200 bps Communications Protocola: HDLC Features: Downline Loading (Or-Line Reconfiguration), Automatic Repoet Request, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,625 to \$2,650 Date First Installed: 1979

TIMEPLEX, INC.
SERIES II MICROPLEXER M24
Multiplexer Clase: Statistical
Input Interface: RS-232C, RS-422,
CCITT V.24/V.28, MIL 188C
Maximum Input Channels:
Synchronous: 24

Asynchronous: 24 Transmission Mode: Half-Duplex, Full-Duplex, Full-Duplex, Input Transmission Rates: Asynchronous/Synchronous - 50 bps: Asynchronous - 75 bps: 110 bps; 300 bps; 600 bps; 1,200 bps; 3,800 bps; 2,400 bps; 3,800 bps; 7,200 bps; 9,800 bps

ate Transmission Rate

2,304 bps
Maximum Output Lines:
Asynchronous: 2
Output Transmission Mode: FullDuplex
Output Line Transmission Rates:
Synchronous - 9,600 bps, 14,400

bps, 19,200 bps; Asynchronous -

14,400 bps
Communications Protocola: HDLC
Features: Downline Loading (OnLine Reconfiguration), Automatic
Repeat Request, Plyback Buffering
Delay, Operational and Statistical
Reports, Flow Control,
Programmable, Network Monitor
Diagnostic Features: Remote, Local
Distribution Method: End user
Price: \$2,655 to \$3,420

TIMEPLEX, INC.
SERIES II MICROPLEXER M48
Multiplexer Class: Statistical
Input Interface: RS-232C, RS-422,
CCITT V.24V.28, MIL 188C
Maximum Input Channels:
Synchronous: 48
Asynchronous: 48
Transmission Mode: Half-Duplex,
Full-Duplex

Full-Duplex Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,600 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 4,608 bps Mazimum Output Lines:

Majuration Output Lines:
Asynchronous: 2
Output Transmission Mode: Fullbuplex
Output Line Transmission Rates:
Synchronous: 9,800 bps, 14,400
bps, 19,200 bps
Communications Protocols: HDLC
Features: Downline Loading (OnLine Reconfiguration), Automatic
Repeat Request, Flyback Suffering
Delay, Port Contention, Switching,
Operational and Statistical Reports,
Flow Control, Programmable
Diagnostic Features: Remote, Local
Distribution Method: End user
Price: \$4,890 to \$5.150

Date First installed: 1981

TIMEPLEX, INC. SWITCHING MICROPLEXER SM8 Multiplexer Cleas: Statistical Input Interface: RS-232C, RS-422, CCITT V.24V.28, MIL 188C Maximum Input Channels:

Asynchronous: 8
Transmission Mode: Hall-Duplex, Full-Duplex, Full-Puplex, Full-Pupl

Maximum Output Lines:
Asynchronous: 2
Output Transmission Mode: FullDuplox
Output Line Transmission Rates:
Synchronous - 9,600 bps, 14,400
bps
Communications Protocols HDLC
Features: Downline Loading (On-

Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1,800 to \$2,825 Date First Insaliser. 1981

TIMEPLEX, INC.
SWITCHING MICROPLEXER SM24
Multiplexer Class: Statistical
Input Interface: RS-232C, RS-422,
CCITT V.24/V.28, MIL 188C
Maximum Input Changels:

Maximum Input Channels: Synchronous: 24 Asynchronous: 24 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - Up to 9,600 bps Aggregate Transmission Rate: 2,304 bps Maximum Output Lines:

Asynchronous: 2 Output Transmission Mode: Full-Duplex Output Line Transmission Rates: Synchronous - 9,600 bps, 14,400 bps

Communications Protocols: HDLC Features: Downline Loading, Automatic Repeat Request, Flyback Buffering

Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user

Price: \$2,830 to \$3,855 Date First Installed: 1981 TIMEPLEX, INC.

TIMEPLEX, INC.
SWITCHING MICROPLEXER SM48
Multiplexer Cleas: Statistical
input Interface: RS-232C, RS-422,
CCITT V.24/V.28, MIL 188C
Maximum Input Channels:

Synchronous: 48 Asynchronous: 48 Transmission Mode: Half-Duplex, Full-Dunley Input Transmission Retes: Asynchronous - Up to 9,800 bps **Aggregate Transmission Rate:** 

Maximum Output Lines: Asynchronous: 2 **Output Transmission Mode: Full-**Dunley

Output Line Transmission Rates: Synchronous - 9,600 bps, 14,400

Communications Protocols: HDLC Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$4.125 to \$5.150

TIMEPLEX, INC. WIDEBAND MICROPLEXER WM48 Multiplexer Class: Statistics Input Interface: RS-232C, RS-422 CCITT V 24/V 28 MIL 188C Maximum input Channels:

Synchronous: 48 Asynchronous: 48 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rat Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 4.608 bps

Maximum Output Lines: Asynchronous: 1 **Output Transmission Mode: Full-**Duplex

**Output Line Transmission Rates** Asynchronous/Synchronous - 72,000

Commun cations Protocols: HDLC Features: Downline Loading (On-Line Reconfiguration), Automatic Repeat Request, Flyback Buffering Delay, Operational and Statistical Reports, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$6,025 Date First Installed: 1982

TIMEPLEX, INC. LNK1-T1 FACILITIES MANAGEMENT SYSTEM Multiplexer Class: TDM Input Interface: RS-232C, RS-422, MIL 188C

Maximum Input Channels: Synchronous: 44 Asynchronous: 44 Transmission Mode: Full-Duplex Input Transmission Rates: Asynchronous/Synchronous - Up to 51,000 bps

Asynchronous: 1 **Output Transmission Mode: Full-**

Maximum Output Lines:

Dunley **Output Line Transmission Rates:** Asynchronous - T-1 Feetures: Operational and Statistical Reports, Flow Control, Programmable, Network Monito Diagnostic Features: Remote, Local Distribution Method: Fnd user Date First Installed: 1983

TIMEPLEX, INC. TIMEPLEXER TIG TOM Multiplexer Class: TDM Input Interface: RS-232C, RS-422. CCITT V.24/V.28, MIL 188C Meximum Input Channels: Synchronous: 16

Asynchronous: 16 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rates: Asynchronous - 2,400 bps; Synchronous - 9,600 bps **Maximum Output Lines:** 

Asynchronous: 1 **Output Transmission Mode: Full-**Duplex Output Line Transmission Rates: Synchronous - 14,400 bos Features: Operational and Statistical Reports, Flow Control. Programmable Diagnostic Features: Remote, Local Distribution Method: End user Price: \$1.725 Date First Installed: 1971

TIMEPLEX, INC. TIMEPLEXER T-20 TOM Multiplexer Class: TDM Input Interface: RS-232C, RS-422, CCITT V.24/V.28, MIL 188C Transmission Mode: Half-Duplex, **Full-Duplex** Input Transmission Rates: Asynchronous - 2,400 bps; Synchronous - 9,600 bps eximum Output Lines: Asynchronous: 1

**Output Transmission Mode: Full-**Duplex **Output Line Trens** ion Rates: Synchronous - 14,400 bps Features: Operational and Statistical Reports, Flow Control. Programmable Diagnostic Features: Remote, Local Distribution Method: End user Price: \$2,050

TIMEPLEX, INC. TIMEPLEXER T-98 TDM Multiplexer Class: TDM Input Interface: RS-232C, RS-422 CCITT V.24/V.28, MIL 188C Maximum Input Channels: Synchronous: 96

Asynchronous: 96 Transmission Mode: Half-Duplex, Input Trensmission Rates Asynchronous - 19,200 bps; Asynchronous/Synchronous - 64,000

**Maximum Output Lines:** Asynchronous: 3 **Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** 

Asynchronous/Synchronous - Up to 256,000 bps Features: Operational and Statistical Reports, Flow Control. Programmable Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3.270 Date First Installed: 1974

TIMEPLEX, INC. MICROPLEXER X.25 PAD Multiplexer Class: Statistical Multiplexer Class: Packet Assembler/Disassembler Input Interface: RS-232C, RS-422, CCITT V.24/V.28 Maximum Input Cha

Synchronous: 48 Transmission Mode: Half-Duplex, Full-Duplex Input Transmission Rate Asynchronous - Up tp 9,600 bps Asynchronous/Synchronous - 600 bps. 3,600 bps Aggregate Transmission Rate: 4,608 bps Maximum Output Lines: Asynchronous: 2

**Output Transmission Mode: Full-**Duplex **Output Line Transmission Rates:** Synchronous - 9,600 bps, 14,400 Communications Protocols: HDLC Features: Automatic Speed Detection (Autobaud), Protocol Conversion, Automatic Repeat Request, Operational and Statistical Reports Flow Control Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user

PEX-1 INTELLIGENT DATA MULTIPLEXER Multiplexer Class: Network Concentrator Input Interface: RS-232C, RS-422 Maximum Input Channels: Synchronous: 14

Price: \$1,750

USDATA, INC.

Date First Installed: 1983

Input Transmission Rates: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Communications Protocols: Ascii Diagnostic Features: Remote, Local

Price: \$3,500 (See Vendor Profile Page V-32) WANG LABORATORIES, INC. CMUX-2370 CABLE MULTIPLEXOR

Multiplexer Class: TDM Input Interface: IBM Type "A" Coaxial **Maximum Input Channels:** 

Asynchronous: 32 Transmission Mode: Half-Duplex Input Transmission Rates Asynchronous/Synchronous - 23,500 bos Aggregate Transmission Rate: 23,500 bps

Maximum Output Lines:

Asynchronous: 1 **Output Transmission Mode: Half-Output Line Transmission Rate** Asynchronous/Synchronous - 23,500

Communications Protocols: SDLC Diagnostic Features: Remote, Local Distribution Method: End user Price: \$3,375 Date First Installed: November 1983 Number Installed to Date: Under (See Vendor Profile Page V-32)

WESTERN DATACOM

Multiplexer Class: Statistical Input Interface: RS-232C, 20 mA Current Loop Meximum Input Chi

Synchronous: 3 Transmission Mode: Full-Duplex **Input Transmission Rate** Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Aggregate Transmission Rate: 96 **Maximum Output Lines:** 

Synchronous: 1 Output Transmission Mode: Full-Duples **Output Line Transmission Rate** Asynchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 9,600

inications Protocols: High Protocol Streaming Features: Data Compression, Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Flow Control, Automatic Speed Detection, Autodial Throughput Diagnostic Features: Remote, Local Distribution Method: Third-party Price: \$875 Date First Installed: August 1982 Number Installed to Date: 150 (See Vendor Profile Page V-33)

XYPLEX, INC. XYPLEX SYSTEM **Multiplexer Class: Statistical** Input Interface: RS-232C Transmission Mode: Full-Duplex Asynchronous - 9,600 bps Maximum Output Lines: Synchronous: 1

Output Transmission Mode: Full-Duplex **Output Line Transmission Rates:** Asynchronous/Synchronous - 1M bps

Features: Automatic Speed Detection, Downline Loading, Automatic Repeat Request, Flyback Buffering Delay, Port Contention, Switching, Flow Control, Programmable, Network Monitor Diagnostic Features: Remote, Local Distribution Method: End user Price: \$700 Date First Installed: October 1982

Number Installed to Date: Under (See Vendor Profile Page V-33)

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Office automation you can't outgrow



# **Index to Converters/Emulators**

Converters are devices (or software) that convert the transmission characteristics of one data stream to different transmission characteristics. Included in this category are interface, protocol, speed and code conversion products.

Emulators permit one computer system to execute programming written for another computer system.

The index to converters/emulators is arranged alphabetically by vendor and contains the unit price as well as the page number on which the complete listing can be found.

VENDOR	MODEL PRICE	Pr	AGE
Aglie Corp.	MODEL 3651 TWINAX PROTOCOL CONVERTER. \$2.495		26.6
	MODEL 5287 PROTOCOL CONVENTOR \$2.500		84
	MODEL 6287 PROTOCOL CONVERTER \$2,500		84
	PROGRAMMABLE COMMUNICATIONS INTERFACE LC-300 \$2,995		0.4
			D-4
	PROGRAMMABLE COMMUNICATIONS INTERFACE LC-36		D-4
Air Land Systems Corp	PRINTER INTERFACES MPC-SERIES \$1,200 to \$1,850		D-4
	PROTOCOL CONVERTERS PCU-SERIES \$1,400 to \$5,000		8-4
Alphamatrix, Inc	BAE-800 \$1,495		8-4
Amdahl Corp			B-4
	4450 NETWORK CONCENTRATOR		B-4
	4470 NETWORK CONCENTRATOR \$12,500		B-4
Annagari			8-4
Apex Technology			B.A
	T-10 \$3.500		8-5
AST Research, Inc.			8.4
AST Research, Inc.	AST-PCOX \$1.190		8-5
			53
	AST-SNA		27-5
	AST-3780		B-5
	AST-5251 \$890		8-5
Atlantic Research Corp	IFA-SERIES \$220 to \$1,150		8-5
Avatar Technologies, Inc.	PA 1000 \$990		8-5
A. W. Computer Systems, Inc	A.W. P.C. TYPE 1 \$2,000 to \$2,200		8-5
	A.W. P.C. TYPE 3	0	8-5
Backus Data Systems, Inc	DIGILINK II		8-5
Betacom Corp.		7	8-6
Black Box Catalog/Expander Inc.			8.4
Chi Cors.			8-5
CHI Corp	RAINBOW 100 UNIVAC ADAPTER KIT \$2,000		8-8
Commtex, Inc.	TERMINAL CONCENTRATOR: MDS-8070 \$4,000 to \$20,000		8-6
	TEHMINAL CONCENTRATOR; MDS-80/0		
Computer Communications Specialists, Inc			8-6
Computer Peripheral Systems, Inc			5-0
Computer Systems			8-6
Com/Tech Systems, Inc.			8-6
Connecticut Microcomputer, Inc			8-1
	BUSSTER RG	5	8-6
	SADI \$29.	5	B-6
Control Concepts	PROTOCOL CONVERTER/CC-3274 \$4.995 to \$18.995		8-6
Data General Corp.			8-6
	DG/3270		8-6
	HASP N/		8.
	RCX70.	4	8-4
	RJE80		-
Datagram Corp			84
			20
Data Plus, Inc.			0-1
Dataprobe, Inc.			
Datastream Communication, Inc			
	776 \$4,000 to \$6,00		
	874 \$16,00	0	8-1
	MPC \$8,000 to \$12,000		8-1
Data Technologies Industries	MIDDLEMAN	0	8-1
DCA/TAC	INA/ATC \$8,950 to \$14.95	0	8-1
Digital Associates Corp.			
	RLPS 901000 \$6.75		
Divarsified Data Resources, Inc.			8-1
			8-1
Dynatech Data Systems			B-1
	DYNA-TEST 2000 C	0	D-7
Dynatech Packet Technology, Inc.	MULTI-PAD X.25	0	E

# Converter/Emulator Index

natech Packet Technology, Inc.	MODEL PRICE	P
	MULTI-PLEX X.25	t
se Technology	MESSAGE HANDLER \$495 to \$1,995	!
	FS-100 CODEM \$13,000	
mielf Date, Inc.	IFC 200 SERIES \$400 to \$650	
	PIN 3270E-7 \$7,900 to \$13,000	
town Communications Inc	GATEWAY PROCESSOR \$1,560	
neway Communications, Inc	GATEWAY PHOCESSON	
nriksen Data Systems	COMMCENTER 2 \$995	
il Corp	7426 N/A	
t Corp	VTS 352 \$5,800 to \$8,200	
Associates, Inc.	IDECOMM 3278/NPR-001 SPR-IN\$1,195	1
ovatek Microsystems, Inc	IMI SERIES 570. \$600 to \$2,000	
evetive Electronics. Inc.	MC-80/100 \$1,445 to \$1,645	
annua mannanal man	MC-80/200 \$1,445 to \$1,645	
	MC-80/300 \$2,095 to \$2,245	
	MC-80/400 \$2,095 to \$2,245	
	MC-80/600 \$1,495 to \$1,695	
	MC-80/602 \$1,650	
Com, Inc	3270 IPC\$15.000	
	V 00 100	
grated Decign Engineering, Inc.	IDE-3011	
stegrated Design Engineering, Inc.	IDE 0040	*********
	IDE-3013	********
	IDE-3014	
	IDE-3015	
	IDE-3016	
	IDE-3018	
illigent Businese Systems, Inc	CSX 1024	
	CSX-1024 \$60,000	
Med I a	2101/2501 \$995 to \$1,900	
rell Systems, Inc	8276-1	
	8276-12	
Composition Systems	MULTIDISK READER	
M Electronics	52/0-12 \$3,500 MULTIDISK READER \$12,900 to \$15,900 ASYNCHRONOUS PROTOCOL CONVERTERS \$995	
dman Basassch Manufacturing, Inc.	MODEL 870	
minima management announcementally arrest	MODEL 871 \$3,395 to \$8,295	
	WODEL 071	********
	MODEL 872 \$3,395 to \$8,295	
W Systems Corp		
	3770 \$4,550	
	3777 SERIES II	
	HASP. \$4,550	
cal Data, Inc.		
	DATALYNX 3780 \$1,750	
	INTERLYNX 3278 \$1,395	
	INTERLYNX 3287 \$1,750 MICRO800/X.25 CONCENTRATOR PAD \$2,050 to \$4,600	
om Systems, Inc	MICRO800/X.25 CONCENTRATOR PAD \$2,050 to \$4,600	
	MICRO7400 PROTOCOL CONVERTER \$1,650 to \$4,750	
rolog, Inc.	BABYTALK \$895	
west Data Source	APPLE II \$695 to \$1,500	
	APPLE III \$695 to \$1,500	
	IBM \$140 to \$1,200	
town Phys. Lee	IBM \$140 to \$1,200	
	BRITE ONE \$1,280	
	BRITE ONE \$1,280	
ional Computer Systems, Inc.	BRITE ONE         \$1,280           SMRTE ONE         \$3,900           PROTOCOL CONVERTER         \$1,500	
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# Converter/Emulator Index

VENDOR	MODEL PRICE	PA	GE
Protocol Computers, Inc.	3780/SNA	B	- 18
	PCI SERIES \$1,850 to \$8,500	B	-18
	R73SX CONVERTER \$5.500		-18
	VIDROTEX 67		
A	SQ1		18
Quasitronics, Inc.			
	STI\$300 to \$400		- 18
Recal-Telesystems, Inc.	202 NETWORKING TRANSLATOR		-18
	404 CENTRAL SITE TRANSLATOR\$3,995		-18
Radian Corp.			-18
Ranax Corp.	TRANSLATOR-3270	B	-18
Shaffstall Corp.		)	
Sherwood Digital Electronics	A/S-2. A/S-3 \$1,495 to \$2,495		. 19
anerwood bigital Electronics	PQ4 PQ5 \$1,495 to \$2,495		- 19
			1
	STARNET II		
	STRATUS/32 CONTINUOUS PROCESSING SYSTEM		- 18
Synaita Systems			- 18
	STD SER 2 \$490		-18
Tandy Corp.	T 76	)	- 19
Techiand Systems, Inc.	BLUE LINX 3275/6 BISYNCH \$690		- 15
socialist alatama) mos	BLUE LINX 3276/SDLC. \$690		- 15
	BLUE LINX 5251/12		- 11
	VTERM \$16		-20
Tektronix, Inc			1-20
Telebyte Technology, Inc			1-20
	64	D	3-20
	65	D	3-20
	78		1-20
4	SERIES 63 \$99 to \$120		1-20
Teleface Corp			
Teleprocessing Products, Inc.			3-20
	TP-200M		3-20
	TP-300 \$45		3-20
	TP-350 \$45	0	3-20
Teltone Corp.	M-871 ACCESS CONTROLLER N/A	A I	3-20
Thomas Engineering	MZ80\$5,000 to \$12,00	0	3-21
THW Corp.			1-2
Their Corps	TNW 1000		3-2
	TRW 2000		3-2
Trendata Standard Memories Corp		0	
Tri-Data	NETWAY COMMUNICATIONS PROCESSOR \$11,00	0	3-2
Via West, Inc.	CST 100 \$15	0	3-2
***************************************	PSI 100	0	3-2
	VST 2000		22
Wastern Reteam	DATACOM 1000\$2.00	0	
Xyguad, Inc	A-100	V P	56

# Converters/Emulators

AGILE CORP.

MODEL 3651 TWINAX PROTOCOL CONVERTER

Conversion Function: Protocol Conversion

Number of Ports Supported: 2 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Protecoil Conversion: IBM System/ 34, System/38 to RS-232C, IBM

Series/1 to RS-232C Features: Diagnostics, Polling Price: \$2,495

Price: \$2,495 Distribution Method: End user (See Vendor Profile Page V-1)

AGILE CORP.

MODEL 5287 PROTOCOL CONVERTER Conversion Function: Protocol

Conversion
Number of Ports Supported: 1
Transmission Mode: Full-Duplex
Standard Transmission Rate:
Asynchronous - 1,200 bps, 2,400
bps, 4,800 bps, 9,600 bps, 19,200

bips Protocol Conversion: IBM 3270 BSC to Ascil RS-232C, 3270 SNA/SDLC to Ascil RS-232C, Local 3270 DCA to Ascil RS-232C Features: Diagnostics, Polling Price: \$2,500

Distribution Method: End user Number Installed to Date: 500 -1,000

Date First Installed: September 1981

AGILE CORP. MODEL 6287 PROTOCOL CONVERTER

Conversion Function: Protocol Conversion Number of Ports Supported: 1 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps, 19,000 bps, 19,200 bps Protocol Conversion: IBM 3270 BSC to Asoil RS-232C, 3270 SNA/SDLC to Asoil RS-232C, 3270 Local DCA to Asoil RS-232C, 3270 Local DCA to Asoil RS-238C, 3270 RMA/SDLC to Asoil RS-238C, 3270 RMA/SDLC

Features: Diagnostics, Polling Price: \$2,500 Distribution Method: End user

AGILE CORP. PROGRAMMABLE COMMUNICATIONS INTERFACE

Conversion Function: Protocol Conversion

Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 1,800 bps, 3,800 bps, 7,200 bps, 9,600 bps;

Asynchronous/Synchronous - 300 bps, 600 bps, 1,200 bps, 2,400 bps, 4,800 bps; Asynchronous - 19,200 brs Protocol Conversion: HP MTS 3000 to RS-232C

Price: \$2,995
Distribution Method: End user
Number Installed to Date: 500 -

Date First installed: March 1981

AGILE CORP. PROGRAMMABLE

PROGRAMMABLE COMMUNICATION INTERFACE MODEL LC-36

Conversion Function: Protocol Conversion

Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous - 9,600 bps, 19,200 bos

Protocol Conversion: Burroughs Poll Select to Asynchronous Asoli Features: Diagnostics, Polling Price: \$995 Distribution Method: End user

Number Installed to Date: 500 -1,000 Date First Installed: November 1977

Date First installed: November 19/

AIR LAND SYSTEMS CORP. PRINTER INTERFACES MPC-SERIES

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 1 Transmission Mode: Half-Duplex,

Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 2,400 bps, 9,600

bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebodic to Ascii, Baudot to Ascii, XS 3 to Ascii Interface Conversion: Serial RS-232 to Parallel Controlles

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: IBM BSC
2780 to Ascil Unblocked, Honeywell
VIP to Asci Unblocked, Sepry U100
to Ascil Unblocked, Sepry U100
to Ascil Unblocked
Features: Data Compression,
Diagnostics, Polling, Autoenswer
Price: \$1,200 to \$1,850
Distribution Method: End user,
OEM, Third-party
Mumber installed to Date: 5,000 -

10,000 Date First installed: 1972 (See Vendor Profile Page V-1)

AIR LAND SYSTEMS CORP. PROTOCOL CONVERTERS PCU-

SERIES
Conversion Function: Interface
Conversion, Code Conversion,
Protocol Conversion, Speed
Conversion, Emulator
Number of Ports Supported: 16
Transmission Mode: Half-Duplex,
Evil Duplex.

Standard Transmission Rate:

Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600

bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic to Ascii, XS 3 to Ascii, Baudot to Ascii Interface Conversion: Serial RS-232

to Serial RS-232 Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Duplex
Protocol Conversion: IBM PC 2780
to Ascii Asynchronous, Honeywell
GRTS to Ascii Asynchronous, Sperry
U100 to Ascii Asynchronous
Features: Concentration, Data

Compression, Diagnostics, Polling, Autoanswer Price: \$1,400 to \$5,000 Distribution Method: End user,

OEM, Third-party Number Installed to Date: 5,000 -10,000 Date First Installed: 1972

ALPHAMATRIX, INC.

BAE-800

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed

Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bbs

Code Conversion: Ascii to Ebcdic, Baudot to Ascii, Ebcdic to Ascii Interface Conversion: RS-232C to 20 mA Current Loop, RS-232C to 60 mA Current Loop

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: BSC to Ascii, AXDX to Ascii, BLC to Ascii Features: Concentration, Data Compression, Diagnostics, Polling, Autoanswer

Price: \$1,495 Monthly Maintenance Fee: \$25 Distribution Method: End user Number Installed to Date: Under

100 Date First Installed: 1978 (See Vendor Profile Page V-1)

AMDANL CORP.
4440 NETWORK CONCENTRATOR
Conversion Function: Protocol
Conversion

Number of Ports Supported: 40 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps;

Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Protocol Conversion: Asynchronous to X.25, X.25 to Asynchronous Features: Concentration, Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$6,700 to \$14,000 Monthly Maintenance Pee: \$80 Distribution Method: End user Number Installed to Date: Under

Date First Installed: December 1982 (See Vendor Profile Page V-2)

AMDANL CORP. 4450 NETWORK CONCENTRATOR

Conversion Function: Protocol Conversion Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Refe: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 pps, 7,200 bps, 9,800 bps, 19,200 bps

Ebodic to Ascil Protocol Conversion: Bisynchronous 3270 to X.25, X.25 to Bisynchronous 3270

Features: Concentration, Diagnostics, Polling Price: \$10,700

Monthly Maintenance Fee: \$70 Distribution Method: End user Number Installed to Date: Under 100

Date First Installed: January 1983

AMDANL CORP.
4470 NETWORK CONCENTRATOR
Conversion Function: Protocol
Conversion

Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rate: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Protocol Conversion: SDLC/SNA

Protocol Conversion: SDLC/SNA 3270 to X.25, X.25 to SDLC/SNA 3270

Features: Concentration, Diagnostics, Polling Price: \$12,500 Distribution Method: End user Number installed to Date: Under

Date First Installed: February 1984

ANASAZI

KACHINA 2
Conversion Function: Interface
Conversion, Code Conversion,
Protocol Conversion, Speed
Conversion, Emulator

Conversion, Emulator Number of Ports Supported: 5 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rete: Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56,000

Code Conversion: Asoli to Ebcdio Interface Conversion: RS-232C to CCITT V.27

CCITT V.27

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: BLC to HDLC Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoenswer, integrated Modern Price: \$4,000 to \$25,000 Distribution Method: End user Number Installed to Date: 500 -1.000 Date First Installed: 1981

(See Vendor Profile Page V-2)

#### APEX TECHNOLOGY B-10

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 1 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Burroughs to RS-232C

Interface Conversion: Burroughs to Protocol Conversion: Burroughs to

RS-232C Features: Data Compression,

Diagnostics Price: \$1,150 Distribution Method: Third-party Number Installed to Date: Under

Date First installed: 1982 (See Vendor Profile Page V-2)

#### APEX TECHNOLOGY

T-10 Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 1 ssion Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Data Products Parallel to Synchronous RS-232C Interface Conversion: Data Products Parallel to Synchronous RS-232C

Protocol Conversion: Data Products Parailel to Synchronous RS-232C Features: Data Compression, Price: \$3,500

Distribution Method: Third-party Number Installed to Date: Under 100 **Date First Installed: September** 

#### AST RESEARCH, INC. AST-BSC

Transmission Mode: Half-Duplex Price: \$895 Distribution Method: OEM Number Installed to Date: Under 100

Date First Installe J: 1983 (See Vendor Profile Page V-3)

#### AST RESEARCH, INC.

AST-PCOX Conversion Function: Emulator Humber of Ports Supported: 1 Standard Transmission Rate: 2.35M bos Price: \$1,195 Distribution Method: OEM Number Installed to Date: Under Date First installed: 1983

#### AST RESEARCH, INC. AST-SNA Conversion Function: Emulator Transmission Mode: Half-Duplex

Price: \$895 Distribution Method: OEM Number Installed to Date: Under Date First Installed: 1983

# AST RESEARCH, INC.

Conversion Function: Emulator Transmission Mode: Half-Duplex Standard Transmission Rate: Synchronous - 19,200 bps Price: \$945 Distribution Method: OEM Number Installed to Date: Under

## **Date First installed: 1983**

#### AST RESEARCH, INC. AST-5251

Conversion Function: Emulator Transmission Mode: Half-Duplex Standard Transmi Synchronous - 9,600 bps Price: \$895 Distribution Method: OEM Number Installed to Date: Under

100 Date First Installed: 1983

#### ATLANTIC RESEARCH CORP. **IFA-SERIES** Conversion Function: Interface

Conversion smission Mode: Half-Duplex, **Full-Duolex** 

Standard Transmission Rate: All Interface Conversion: RS-232 to V.35, RS-232 to RS-422, RS-232 to X.21, V.10, V.11 Mode Conversion: Half-Duplex to

Full-Duplex, Full-Duplex to Half-Duplex Price: \$220 to \$1,150 Distribution Method: End user Number installed to Date: 100 - 500 Date First Installed: February 1981 (See Vendor Profile Page V-3)

#### AVATAR TECHNOLOGIES. INC.

PA 1000 Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator, PC to 3278, VT-100

Number of Ports Supported: 2 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps, 9,600 bps, Code Conversion: Asynchronous

Ascii to IBM 3278/2 Interface Conversion: RS-232 to Convint

Mode Conversion: Full-Duplex to Half-Duplex
Protocol Conversion: Asynchronous Ascii to IBM Coaxial Features: Diagnostics, Polling, Automatic Data Rate Detection,

Automatic Parity Recognition, Autoanswer, Protocol Conversion Distribution Method: Third-party Number installed to Date: 500 -

Date First Installed: 1983 (See Vendor Profile Page V-3)

# A. W. COMPUTER SYSTEMS,

A.W. P.C. TYPE 1 Conversion Function: Protocol Conversion

Number of Ports Supported: 2 Standard Transmission Rate: Asynchronous - 600 bps, 1,200 bps; Synchronous - 4,800 bps Code Conversion: IBM Ebcdic BSC to NCR Ascii BSC, NCR Ascii BSC to Ascii Asynchronous, IBM Ebcdic BSC to Ascii Synchronous Features: Diagnostics, Polling Price: \$2,000 to \$2,200 Distribution Method: End user Number Installed to Date: Under

Date First Installed: July 1983 (See Vendor Profile Page V-3)

#### A. W. COMPUTER SYSTEMS, INC.

A.W. P.C. TYPE 3 Conversion Function: Protocol Conversion Number of Ports Supported: 2 Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps; Synchronous - 4,800 bps, 9,600 bps Code Conversion: IBM Ebcdic BSC to NCR Ascii BSC, NCR Ascii BSC to Ascii Asynchronous, IBM Ebcdic BSC to Ascii Synchronous Features: Diagnostics, Polling Price: \$7,000 to \$8,000 Distribution Method: End user Number Installed to Date: Under

Date First Installed: July 1983

# BACKUS DATA SYSTEMS,

INC. DIGILINK II

Conversion Function: Code Conversion, Speed Conversion Number of Ports Supported: 6 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Binary. Binary to Ascii Distribution Method: End user Number Installed to Date: Under

(See Vendor Profile Page V-3)

# BETACOM CORP. PROFESSIONAL COMMUNICATION MANAGER-2000

Conversion Function: Protocol Conversion, Emulator Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex

Synchronous - 110 bos: Asynchronous/Synchronous - 300 bps, 1,200 bps Code Conversion: Ebodic to Ascii,

Raudot to Ascii Interface Conversion: IBM PC to Televideo 910, Televideo 800/802 to TTY, IBM Compatible to TTY Features: Diagnostics, Polling, Autoanswer, Autodial, Sign-on Price: \$1,300 to \$2,500

Monthly Maintenance Fee: \$13 Distribution Method: End user Number installed to Date: Under (See Vendor Profile Page V-4)

#### CATALOG/EXPANDER, INC. 48/28

Conversion Function: Protocol Conversion Number of Ports Supported: 1 Transmission Mode: Half-Duplex On Bisynchronous Standard Transmission Rate

Asynchronous/Synchronous - 9,600 Code Conversion: Ebcdic to Ascii

Mode Conversion: Bisynchronous to Asynchronous Protocol Conversion: 2780 to Ascil to 3741 to Ascii, 3780 to Ascii to

Transparent Asynchronous, 2770 to Features: Built-in Modern Emulator

Price: \$1,695 Distribution Method: End user Number installed to Date: 500 -1.000

Date First Installed: January 1982 (See Vendor Profile Page V-4)

# IBM/SPERRY COMPATABILITY

CARD Conversion Function: Emulator Number of Ports Supported: 1 Standard Transmission Rate: Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps 7,200 bps, 9,600 bps, 19,200 bps Features: Data Compression, Diagnostics, Polling, Automatic Parity Recognition Price: \$1,500 Distribution Method: Third-party Number Installed to Date: Under

Date First Installed: March 1982 (See Vendor Profile Page V-5)

# CHI CORP. RAINBOW 100 SPERRY ADAPTER

Conversion Function: Emulator Number of Ports Supported: 1 Standard Transmission Rate: Synchronous - 110 bps, 300 bps,

# Converters/Emulators

600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Features: Data Compression, Diagnostics, Polling, Automatic Parity Recognition, UTS Emulation Price: \$2,000 Distribution Method: Third-party Number installed to Date: Under

Date First Installed: March 1982

COMMYEX, INC. TERMINAL CONCENTRATOR: MDS-8070

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 25 Transmission Mode: Half-Duplex,

Standard Transmission Rate: Asynchronous - 110 bps. 300 bps. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebodic, Ebodic to Ascii

Interface Conversion: RS-422A to RS-232C, 20 mA Current Loop to RS-232C, MIL 188C to RS-232C Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Duplex Protocol Conversion: 3270 SNA/SDLC to Ascii Asynchronous, IBM 3270 BSC to Asci Asynchronous Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, Switching Price: \$4,000 to \$20,000 Distribution Method: Third-party Number Installed to Date: 500 -1 000

Date First Installed: February 1981 (See Vendor Profile Page V-6)

COMPUTER COMMUNICATIONS SPECIALISTS, INC.

**TASK 200** Number of Ports Supported: 2 Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous - 9,600 bos Code Conversion: Component

Interface Conversion: Component Drven Protocol Conversion: Component

Driven Features: Diagnostics, Automatic Parity Recognition Price: \$450

Monthly Maintenance Fee: \$6 Distribution Method: End user Number installed to Dete: Under

Date First installed: April 1983 (See Vendor Profile Page V-6) COMPUTER PERIPHERAL

SYSTEMS, INC. MARS

Conversion Function: Code

Conversion, Speed Conversion Number of Ports Supported: 7 Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Poll/Select to

Interface Conversion: RS-232C to RS-232C, RS-232C to TDI, RS-232C

Mode Conversion: Half-Duplex to Half-Duplex Protocol Conversion: Pol/Select to

Features: Concentration, Data Compression, Diagnostics, Polling Price: \$1,100 to \$4,200 Monthly Maintenance Fee: \$18 Distribution Method: End user Number installed to Date: Under 100

Date First installed: January 1982 (See Vendor Profile Page V-7)

#### COMPUTER SYSTEMS CS/88

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Data Buffer/Converter Number of Ports Supported: 8 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 1,200 bps, 1,800 bps;

Asynchronous/Synchronous - 2,400 bps, 4,800 bps, 9,600 bps, 19,200 Code Conversion: Ascii to Ebodic. Binary to Ebcdic RS-422, RS-232 to Current Loop,

**EIA to TTY Parallel** Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: TTY

Asynchronous to Bysynchronous, SDLC to TTY Features: Concentration, Data Compression, Diagnostics, Automatic Data Rate Detection Price: \$1.500 to \$3.900 Distribution Method: End user Number Installed to Date: Under

Date First Installed: 1982 (See Vendor Profile Page V-7)

COM/TECH SYSTEMS, INC. A-302 RTS EMULATOR Conversion Function:

Asynchronous to Synchronous Conversion Number of Ports Supported: 1 Transmission Mode: Half-Duplex. Full-Duplex

Standard Transmission Rate Asynchronous - 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Mode Conversion: Full-Duplex to Half-Duplex, Asynchronous to Synchronous

Feetures: Automatic Data Rate Detection, Automatic Modern Handshaking Price: \$400 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: 1978 (See Vendor Profile Page V-5)

#### MICROCOMPUTER, INC. BUSSTER OR

Conversion Function: Interface Conversion Number of Ports Supported: 2 Transmission Mode: Full-Duplex Asynchronous - 75 bos. 110 bos 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps ce Conversion: IEEE-488 to **RS-232** Features: Polling, Automatic Parity

Recognition Price: \$495 Distribution Method: End user (See Vendor Profile Page V-7)

**BUSSTER RG** Conversion Function: Interface Conversion Number of Ports Supported: 2 Transmission Mode: Full-Duplex Standard Transmission Rate Asynchronous - 75 bps, 110 bps 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Interface Conversion: RS-232 to IEEE-488 Features: Polling, Automatic Parity Recognition

#### CONNECTICUT MICROCOMPUTER, INC. SADI

Conversion Function: Code Conversion Number of Ports Supported: 2 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: PET Ascii to True Ascil sterface Conversion: RS-232 to IEEE

Features: Automatic Parity Recognition Price: \$295 Distribution Method: End user

CONTROL CONCEPTS
PROTOCOL CONVERTER/CC-3274 Conversion Function: Protocol

Number of Ports Supported: 32 Transmission Mode: Both Half- and Full-Duplex Standard Transmission Rate:

Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps,

4,800 bps, 7,200 bps, 9,600 bps Protocol Conversion: Asynchronous to Bisynchronous, Asynchronous to SNA/SDLC

Features: Concentration, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, Graphics Passthrough Price: \$4,995 to \$18,995 Monthly Maintenance Fee: \$67 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: June 1982 (See Vendor Profile Page V-7)

#### DATA GENERAL CORP.

Conversion Function: Emulator Number of Ports Supported: 4 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate Synchronous - 50 bps, 75 bps, 110 bos. 300 bos. 600 bos. 1,200 bos. 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Features: Data Compression.

Polling, Autoansw Number Installed to Date: Under

(See Vendor Profile Page V-9)

#### DATA GENERAL CORP. DG/3270

Conversion Function: Emulator. SNA/3270 Terminals and Ports Number of Ports Supported: 4 Transmission Mode: Half-Duplex.

Full-Duplex Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bos

Features: Polling
Distribution Method: End user
Number Installed to Date: Under

#### DATA GENERAL CORP. HASP

Conversion Function: Emulator Number of Ports Supported: 16 Transmission Mode: Half-Duplex, Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Distribution Method: End user Number Installed to Date: Under

#### DATA GENERAL CORP.

RCX70 Conversion Function: Emulator Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate Synchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

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# Converters/Emulators

Features: Poling Distribution Method: End user Number Installed to Date: Under 100

#### DATA GENERAL CORP.

RJE80 Conversion Function: Emulator Number of Ports Supported: 16 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Feetures: Poling Distribution Method: End user

# DATAGRAM CORP.

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion Number of Ports Supported: 16

Humber of Ports Supported: 16 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Codis Conversion: Burroughs Poll Select to Ascii, Ascii to Burroughs Poll Salect

Interface Conversion: RS-232C to TDI, RS-232C to 20 mA, 20 mA to TDI

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: Asynchronous - to Burroughs Poll Select - Prestares: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Data Rate Detection, Automatic Pelice: \$6,000 to \$30,000 Distribution Methods: End user Number Installed to Data: 100 - 500 Data Polling Page V-9) (See Vendor Profile Page V-9)

#### DATA PLUS, INC.

Conversion Function: Code
Conversion, Protocol Conversion,
Speed Conversion, Protocol Conversion,
Speed Conversion Mode: Half-Duplex,
Full-Tuplex
Standard Transmission Rate:
Asynchronous/Synchronous - 9,600
bps
Code Conversion: Baudot to Ascii,
Asci to Baudot, Ebodic to Ascii
Blode Conversion: Half-Duplex to

Miode Conversion: Hell-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: SDLC to BDLC, HDLC to BLC, BLC to HDLC Feetures: Concertration, Diagnostics, Polling, Automatic Parity Recognition, Autoanswer Price: \$3,100

Distribution Method: End user Number Installed to Date: Under Date First Installed: January 1983 (See Vendor Profile Page V-9)

#### DATAPROBE, INC.

DR-10

Conversion Function: Protocol Conversion, Speed Conversion Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 1,800 bps, 7,200 bps, 9,600 bps, 1,200 bps Code Cenversition: Ascil to Baudot, Ebodie to Asol, Ebodie to Baudot interface Conversition: Current Loop to EIA, Current Loop to RS-422, Current Loop to RS-422.

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Features: Concentration, Disgnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Made to Specific Needs Price: \$750 Distribution Method: End user Number Installed to Date: Under

100 Data First Installed: 1982 (See Vendor Profile Page V-9)

#### DATASTREAM COMMUNICATION, INC.

Conversion Function: Code
Conversion
Number of Ports Supported: 24
Transmission Moder: Full-Duplex
Standard Transmission Rate:
Asynchronous/Synchronous-110
bps, 300 bps, 600 bps, 1200 bps,
2,400 bps, 3,600 bps, 4,800 bps,
2,400 bps, 3,600 bps, 4,800 bps,
Code Conversion: Asoli to Ebodic,
Ebodic to Asoli
Interface Conversion: RS-232 to

RG-59
Features: Data Compression,
Diagnostics, Automatic Data Rate
Detection, Automatic Parity

Recognition
Price: \$4,000 to \$10,000
Monthly Meintenance Fee: \$40
Distribution Method: End user
Number installed to Date: Under

Date First Installed: 1980 (See Vendor Profile Page V-9)

#### DATASTREAM COMMUNICATION, INC.

COGMMUNICATION, INCC.
776
Conversion Function: Code
Conversion
Number of Ports Supported: 8
Transamisation Mode: Full-Duplex
Standard Transamisation Rate:
Asynchronous/Synchronous - 110
bps, 300 bps, 600 bps, 4,200 bps,
7,200 bps, 9,600 bps, 4,800 bps,
7,200 bps, 9,600 bps
Code Conversion: Ascil to Ebodic,
Ebodic To Ascil
Infrafrace Conversion: RS-232 to
RG-59
Features: Data Compression.

Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition Price: \$4,000 to \$6,000

Monthly Maintenance Fee: \$40 Distribution Method: End user Number Installed to Date: Under 100 Date First Installed: 1980

#### DATASTREAM COMMUNICATION, INC. 874

874
Conversion Function: Code
Conversion
Number of Ports Supported: 16
Transmission Mode: Full-Duplex
Standard Transmission Ruice:
Asynchronous/Synchronous - 110
bps, 300 bps, 60 bps, 1,200 bps,
2,400 bps, 3,600 bps, 4,900 bps,
7,200 bps, 9,600 bps
Code Conversion: Ebcdic to Ascil,
Ascil to Ebcdic
Interface Conversion: RS-232 to
RG-59
Feetures: Data Compression.

Features: Data Compression, Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition Price: \$16,000

Monthly Maintenance Fee: \$55 Distribution Method: End user Number Installed to Date: Under 100

Date First installed: 1981

#### DATASTREAM COMMUNICATION, INC.

MPC
Conversion Function: Code
Conversion
Number of Ports Supported: 24
Standard Transmission Rate:
Asynchronous/Synchronous - 110
bps, 300 bps, 600 bps, 1,200 bps,
2,400 bps, 9,600 bps, 1,200 bps,
2,400 bps, 9,600 bps, 1,200 bps,
7,200 bps, 9,600 bps
7,200 b

Date First Installed: January 1984

#### DATA TECHNOLOGY INDUSTRIES MIDDLEMAN

Conversion Function: Code
Conversion, Emulator
Number of Ports Supported: 1
Transmission Mode: Helf-Duplex,
Full-Duplex
Standard Transmission Rate:
Asynchronous - 150 bps, 300 bps,
600 bps, 1,200 bps, 1,800 bps,
2,400 bps, 3,600 bps, 4,800 bps,
9,600 bps
Code Conversion: Ascil to 12-13 Bit
Pestures: Memory Test Initialization
Price: \$550

Distribution Method: Third-party Number Installed to Date: 100 - 500 Date First Installed: 1980 (See Vendor Profile Page V-9)

#### DCA/TAC

IMA/ATC Conversion Function: Code Conversion, Protocol Conversion Number of Ports Supported: 24 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate:

Standard Transmission Rata:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps:
Asynchronous/Synchronous - 2,400
bps, 4,800 bps, 9,600 bps
Code Conversion: Ascil to Ebodic
Protocol Conversion: Ascil to Ebodic
S270/ISSC, Ascil to SDLC/SNA
Restures: Concentration, Automatic
Data Rata Delection, Dial-up Modern
Support

Support
Price: \$8,950 to \$14,950
Distribution Method: End user,
Third-party
Number Installed to Date: Under

(See Vendor Profile Page V-10)

#### DIGITAL ASSOCIATES CORP. COMMUNICATION PRINTER

INTERFACE 7141 Conversion Function: Interface Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex Synchronous - 1,200 bps, 1,800 bps, 2.400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ebcdic to Ascii Interface Conversion: IBM 2780. 3780 to Parallel Features: Data Compression, Diagnostics, Polling, Automatic Parity Recognition, Autoanswer Price: \$1,650 Monthly Maintenance Fee: \$40 Distribution Method: End user Number Installed to Date: Under 100 Date First Installed: 1979 (See Vendor Profile Page V-10)

#### DIGITAL ASSOCIATES CORP. RLPS 901000

Conversion Function: Interface Conversion Function: Interface Conversion Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Duplex, Full-Puplex, F



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PC/3270 and PC/3780 transmit data at speeds up to 9600 baud.

PERPAYET

Full model

PC/HASP Dynamic design lets you assign incoming I/O streams to different devices disk files, printers and RS-232 ports.

THE DCP/88 BY PERSYST.

# Converters/Emulators

Monthly Maintenance Fee: \$40 Distribution Method: End user

Date First installed: 1981

DIVERSIFIED DATA HYDRA II

Conversion Function: Code Conversion Number of Ports Supported: 16 Transmission Mode: Full-Duplex Standard Trans mission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4 800 bns. 7 200 bns. 9 600 bns Code Conversion: Asci to Ebodic, Ebodic to Ascii Features: Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition, Redundant Data Suppre

Price: \$6,900 to \$9,900 Distribution Method: End user Number Installed to Date: Under 100

Date First Installed: January 1983 (See Vendor Profile Page V-10)

DYNATECH DATA SYSTEMS DYNA-TEST 1600

Conversion Function: Interface Conversion, Code Conversion mission Mode: Half-Duplex. Full-Dunley Standard Transmission Rate: Asynchronous/Synchronous - 50

bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56,000 Code Conversion: Ascii to Ebodic.

Ebcdic to Ascii Interface Conversion: RS-449 to RS-232, V.35 to RS-232, Bell 303 to

BS-232 Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Feetures: Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, High-Speed Integral

Tape Price: \$8,000 Monthly Maintenance Fee: \$35 Distribution Method: End user. Third-party Number Installed to Date: 500 -

Date First Installed: 1980 (See Vendor Profile Page V-11)

DYNA-TEST 2000 C Conversion Function: Interface Conversion, Code Conversion Transmission Mode: Haif-Duplex,

Standard Transmission Rate Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebodic,

Ebodic to Ascii Interface Conversion: RS-449 to RS-232, V.35 to RS-232, Bell 303 to Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Duplex Protocol Conversion: SDLC/SNA to Synchronous Features: Diagnostics, Polling, Automatic Data Rate Detection. Automatic Parity Recognition, Switch Salactable Emuli Price: \$13,000

Monthly Maintenance Fee: \$45 Distribution Method: End user, Third-party or installed to Date: 500 -

DYNATECH PACKET TECHNOLOGY, INC. MUILTI-PAD X.25

Conversion, Protocol Conversion, Speed Conversion Number of Ports Supported: 16 Transmission Mode: Full-Duplex Standard Transmission Rate Asynchronous - 50 bps, 75 bps, 110 bos. 300 bos. 600 bos. 1,200 bos. 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Asynchronous X.25. Baudot to Synchronous X.25 erface Conversion: RS-232 to BS-232 Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Protocol Conversion: Asynchronous Ascii to X.25, Asynchronous Baudot Features: Concentration, Data Compression, Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, Autospeed, Autoparity Price: \$2,695 to \$3,400 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: December 1982 (See Vendor Profile Page V-11)

DYNATECH PACKET TECHNOLOGY, INC.

MILITUPLEY X 25 Conversion Function: Code Conversion, Protocol Conversion. Speed Conversion Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to X.25 riace Conversion: RS-232 to RS-232 de Conversion: Half-Duplex to Full-Duplex

GANDALF DATA, INC. Protocol Conversion: Asynchronous IFC 200 SERIES Conversion Function: Interface Ascii to X.25 Features: Concentration, Data Conversion Compression, Diagnostics,

Number of Ports Supported: 1 Code Conversion: RS-232C to RS-422 or RS-423, CCITT V.35 to RS-Automatic Data Rate Detection, Automatic Parity Recognition.

Autoanswer, Autospeed, Autoparity Price: \$1,895 to \$2,695 Distribution Method: End user Number Installed to Date: 500 -1.000 Date First Installed: December 1980

EDGE TECHNOLOGY MESSAGE HANDLER Conversion Function: Interface

Conversion, Code Conversion, Protocol Conversion, Speed Number of Ports Supported: 3 Transmission Mode: Half-Duplex,

Standard Transmission Bate Asynchronous - 9,600 bos Code Conversion: Baudot to Ascii, Ascii to Baudot Interface Conversion: RS-232C to

CCITT V.27 Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Features: Diagnostics, Polling. Automatic Data Rate Detection, Price: \$495 to \$1,995

Distribution Method: OEM Number installed to Date: 500 -Date First Installed: 1978 (See Vendor Profile Page V-11)

FORMSCAN, INC.

FS-100 CODEM Conversion Function: Interface Conversion, Code Conversion. Protocol Conversion, Speed Conversion, Full Document Conversion Number of Ports Supported: 2 Transmission Mode: Half-Duplex,

Standard Transmission Rate: Synchronous - 2,400 bps. Asynchronous - 9,600 bps Code Conversion: Ascil to Configured, Ebcdic to Configured, Typsetting to Configured nierlace Convers Asynchronous to BSC, BSC to BSC, Asynchronous to Asynchronous Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Protocol Conversion: Teletype to Configured, 2770 to Configured. 3780 to Configured Features: Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition,

Autoanswei Price: \$13,000

Distribution Method: End user Number Installed to Date: Under **Date First Installed: September** 

(See Vendor Profile Page V-12)

(See Vendor Profile Page V-12) GANDALF DATA, INC. PIN 3270E-7

232C, Bell 301 or RS-422, RS-423 to

RS-232C

5.000

Price: \$400 to \$650 Distribution Method: End user Number Installed to Date: 1,000 -

Number of Ports Supported: 16 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps. 4,800 bps, 7,200 bps, 9,600 bps Protocol Conversion: TTY II to 3270 BSC Features: Diagnostics, User

Programmable Price: \$7,900 to \$13,000 Distribution Method: End user Number Installed to Date: Under

Date First Installed: 1983

GATEWAY COMMUNICATIONS, INC. GATEWAY PROCESSOR

Conversion Function: Interface Conversion, Code Conversion. Protocol Conversion, Speed Conversion, Emulator **Number of Ports Supported: 18** Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 9.600 bps;

Asynchronous/Synchronous - 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bos. 19.200 bos Code Conversion: Ascii to Ebodic. Ebodic to Ascii Interface Conversion: SNA to Ascii, SNA to BSC. BSC to SNA Mode Conversion: Half-Dupley to

Full-Duplex, Full-Duplex to Half-Protocol Conversion: 3270 SNA to Ascii. BSC 3270 to Ascii Features: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$1,560

(See Vendor Profile Page V-12) COMMUNICATIONS, INC.

GATEWAY PROCESSOR Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 18 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps; Asynchronous/Synchronous - 2,400 bos. 3,600 bps. 4,800 bps. 7,200 bps, 19,200 bps

Code Conversion: Ascii to Abcdic, Epodic to Ascii Interface Conversion: SNA to Ascil. SNA to BSC, BSC to SNA Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: 3270 SNA to Ascii, BSC 3270 to Ascii Features: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$1,560 Distribution Mathod: Third-party

HENRIKSEN DATA SYSTEMS COMMCENTER 2 Conversion Function: Interface Conversion, Code Conversion,

Speed Conversion Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Duplex Code Conversion: Ascii to Ebcdic.

Ascii to Baudot Interface Conversion: RS-232 to RG-11

Features: Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$995

Distribution Method: Third-party Number Installed to Date: 5,000 -Date First Installed: April 1980 (See Vendor Profile Page V-14)

#### IBM CORP.

7426 Conversion Function: Protocol Conversion

Transmission Mode: Half-Duplex.

Full-Dunley Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Protocol Conversion: Ascii to SDLC Feetures: Diagnostics, Autoanswer (See Vendor Profile Page V-14)

ICOT CORP. VTS 352

Conversion Function: Code Conversion, Protocol Conversion, Number of Ports Supported: 16 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to 3270 Ebodio Mode Conversion: Half-Duplex to

Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: Ascii to Bisynchronous, Ascii to SDLC

Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition. Autoanswer, Multiple Host, Automatic Log-on

Price: \$5.800 to \$8.200 Distribution Method: Third-party Number Installed to Date: Under

Date First Installed: 1982 (See Vendor Profile Page V-15)

IDE ASSOCIATES, INC. IDECOMM 3278/NPR-001 SPR-IN Conversion Function: Emulator Number of Ports Supported: 1 Transmission Mode: Half-Duplex 25000 bps Code Conversion: IBM PC to IBM

version: IBM PC to IBM 3276/3274 Protocol Conversion: IBM PC to IRM 3278/3274 ures: Diagnostics, 3276/3274 to

IBM PC Conversion Price: \$1,195 Distribution Method: Third-party Number installed to Date: Under

Date First installed: December 1983 (See Vendor Profile Page V-15)

INNOVATER MICROSYSTEMS. INC.

IMI SERIES 570 Conversion Function: Interface

Conversion, Code Conversion, Protocol Conversion, Speed Conversion Number of Ports Supported: 5 Transmission Mode: Half-Duplex,

Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps. 19,200 bps

Code Conversion: Ascii to Ebcdic, Ebcdic to Ascii, Serial to Parallel Interface Conversion: Ascii to Ebcdic, Ebcdic to Ascii, Serial to

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: Asynchronous

to Printer Features: Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$600 to \$2,000

Distribution Method: OEM Number Installed to Date: Under Date First Installed: 1981 (See Vandor Profile Page V-16)

IMNOVATIVE ELECTRONICS.

MC-80/100 Conversion Function: Protocol Conversion, Emulator Number of Ports Supported: 2 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmission Rate:

Asynchronous - 9,600 bos: Synchronous - 19,200 bps Protocol Conversion: 2780/3780 BSC to Asynchronous Ascii

Features: Diagnostics, Polling, Autoanswer Price: \$1.445 to \$1.645 Distribution Method: End user Number Installed to Date: 100 - 500 Date First installed: January 1980 (See Vandor Profile Page V-16)

INNOVATIVE ELECTRONICS.

MC-80/200 Conversion Function: Protocol Number of Ports Supported: 2

Transmission Mode: Half-Duplex, Full-Duplex Asynchronous - 9,600 bps; Synchronous - 19,200 bps Protocol Conversion: Burroughs

Poll/Select to Asynchronous Ascii Features: Diagnostics, Polling, Autonosy Price: \$1,445 to \$1,645 Distribution Method: End user Number Installed to Date: 500 -

1.000 Date First Installed: January 1980

INNOVATIVE ELECTRONICS.

MC-80/300 Conversion Function: Protocol

Number of Ports Supported: 2 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmission Rate Synchronous - 9,600 bps; Asynchronous - 19,200 bps Protocol Conversion: IBM 3270 BSC to Burroughs Poll/Select

Features: Diagnostics, Polling, Autoanswer Price: \$2,095 to \$2,245 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: January 1980

INNOVATIVE ELECTRONICS.

MC-80/400 Conversion Function: Protocol Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate Asynchronous - 9,600 bps, Synchronous - 19,200 bos Protocol Conversion: IBM 3270 BSC to NCR Poll/Select

Features: Diagnostics, Polling, Autoanswer Price: \$2,095 to \$2,245 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: January 1980

INNOVATIVE ELECTRONICS,

MC-80/500 Conversion Function: Protocol Conversion, Emulator Number of Ports Supported: 2 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmiss Asynchronous - 9,600 bps;

Synchronous - 19,200 bps Code Conversion: Ebodic to Ascil Mode Conversion: Synchronous to Asynchronous Protocol Conversion: 3270 BSC to Asynchronous Ascii Features: Diagnostics, Polling, Autoanswer Price: \$1,495 to \$1,695 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: October 1980

INNOVATIVE ELECTRONICS,

MC-80/602

Conversion Function: Protocol Number of Ports Supported: 1 Transmission Mode: Half-Duplex,

Standard Transmission Rat Asynchronous - 9,600 bos: Synchronous - 19,200 bps Protocol Conversion: 3270 BSC to Asynchronous Ascii Features: Diagnostics, Polling, Autoanswa

Price: \$1,650 Distribution Method: End user Number Installed to Date: Under

Date First Installed: December 1982

INTECOM, INC.

3270 IPC Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 16 Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to IBM 3270 Bisynchronous Protocol Conversion: Ascii to 3270

Bisynchronous Features: Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition, Autoenswer, Price: \$15,000

Distribution Method: End user Number installed to Date: Under

Date First Installed: 1983 (See Vendor Profile Page V-16)

INTECOM, INC.

X.25 IPC Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 16 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 19,200 bps; Asynchronous/Synchronous - 9.600

Code Conversion: Ascii to X.25 Packet

# Converters/Emulators

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: Ascii to X.25 Features: Diagnostics, Automatic Data Bate Detection, Automatic Parity Recognition, Autoanswer, Price: \$15,000

Distribution Method: End user Number Installed to Date: Under 100

Date First Installed: 1983

#### INTEGRATED DESIGN ENGINEERING, INC.

IDE-3011 Conversion Function: Protocol Conversion, Speed Conversion Number of Ports Supported: 1 Transmission Mode: Half-Dupley. Full-Duplex

Standard Trans Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex -

Protocol Conversion: NCR 301 to Serial TTY

Features: Diagnostics, Polling, Automatic Parity Recognition Price: \$500

Distribution Method: End user Number Installed to Date: Under 100

Date First Installed: 1982 (See Vendor Profile Page V-16)

#### INTEGRATED DESIGN ENGINEERING, INC.

IDF-3013 Conversion Function: Protocol Conversion, Speed Conversion,

Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duolex

Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: NCR 301 to

Serial TTY Features: Diagnostics, Polling.

**Automatic Parity Recognition** Price: \$500 Distribution Method: End user Number Installed to Date: Under

**Date First Installed: September** 

#### INTEGRATED DESIGN ENGINEERING, INC. IDE-3014

Conversion Function: Protocol Conversion, Speed Conversion Number of Ports Supported: 4 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps. 7,200 bps. 9,600 bps.

19.200 bos Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Protocol Conversion: NCR 301 to

Serial TTY Features: Concentration, Diagnostics, Polling, Automatic Parity Recognition

Price: \$1,600 Distribution Method: End user Number Installed to Date: Under

**Date First Installed: 1982** 

#### INTEGRATED DESIGN ENGINEERING, INC. IDE-3015

Conversion Function: Protocol Conversion, Speed Conversion, Emulator

Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate:

Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19 200 hos rface Conversion: NCR PC BUS

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-

Duplex Protocol Conversion: NCR 301 to Features: Diagnostics, Polling,

**Automatic Parity Recognition** Primer \$450 Distribution Method: End use mber installed to Date: Under

Date First Installed: 1983

#### INTEGRATED DESIGN ENGINEERING, INC.

DE-3016 Conversion Function: Protocol Conversion, Speed Conversion, Emulator

Number of Ports Supported: 4 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate:

Asynchronous - 50 bos. 75 bos. 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: NCR 301 to

Serial TTY Features: Concentration, Diagnostics, Polling, Automatic Parity Recognition Price: \$1,850

Distribution Method: End user Number Installed to Date: Under Date First Installed: September

INTEGRATED DESIGN ENGINEERING, INC.

IDE-3018

Conversion Function: Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 4 Transmission Mode: Half-Duplex,

Full-Dunley Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110

bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps. 19,200 bos Mode Conversion: Half-Duplex to

Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: NCR 301 to

Serial TTY Features: Concentration,

Diagnostics, Polling, Automatic Parity Recognition Price: \$1,850 Distribution Method: End user Number Installed to Date: Under

Date First Installed: 1982

# INTELLIGENT BUSINESS

Conversion Function: Code Conversion, Protocol Conversion Number of Ports Supported: 2,048 Transmission Mode: Full-Duplex Asynchronous - 50 bps, 75 bps, 110 bos. 300 bos. 9,600: Asynchronous/Synchronous - 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 Code Conversion: Baudot to Ascii.

CCITT X.62 to Telex Protocol Conversion: PSTN DDD to Telex, Teletex to Telex, X.71 to X.75 Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswei

Price: \$60,000 Distribution Method: End user Number Installed to Date: Under 100

Date First Installed: January 1984 (See Vendor Profile Page V-16)

# INTELLIGENT BUSINESS

CSX-1024 Conversion, Speed Conversion Number of Ports Supported: 2,048 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps; Synchronous -19,200 bps, 64,000 bps Code Conversion: Ascii to Baudot, X.61 to Telex Protocol Conversion: X.71 to X.75, Telex to Teletex, PSTN (DDD) to Features: Concentration, Data

Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, Full Redundancy Price: \$60,000 Distribution Method: End user Number installed to Date: Under

Date First Installed: February 1982

2101/2501 Conversion Function: Code Conversion, Protocol Conversion Number of Ports Supported: 5 Transmission Mode: Half-Duplex. Standard Transmission Rate:

Asynchronous/Synchronous - 9,600 bos

Code Conversion: Ascil to Ebodic, Protocol Conversion: IBM BSC to Asynchronous Ascii, IBM SDLC/SNA to Asynchronous Ascii Features: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$995 to \$1,900 Monthly Maintenance Fee: \$20 Distribution Method: Third-party

Number installed to Date: Under 100 **Date First Installed: September** (See Vendor Profile Page V-16)

INTERSIL SYSTEMS, INC.

#### 8276-1

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 hos. 75 hos. 110 hos. 300 hos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to BSC Interface Conversion: Ascii to BSC Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half Duplex Protocol Conversion: Ascii to BSC Features: Diagnostics, Polling, Automatic Data Rate Detection.

Automatic Parity Recognition, Autoans Price: \$3,500 Monthly Maintenance Fee: \$35 Distribution Method: End user Number Installed to Date: Under

Date First Installed: February 1981 (See Vendor Profile Page V-17)

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission RateAsynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to SDLC

Interface Conversion: Ascii to SNA Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: Ascii to BSC Features: Diagnostics, Polling, Automatic Data Rate Detection, **Automatic Parity Recognition** Price: \$3.500

Monthly Maintenance Fee: \$35 Distribution Method: End user Number Installed to Date: Under Date First installed: February 1981

ITEK COMPOSITION SYSTEMS

MULTIDISK READER Conversion Function: Floppy Disk Conversion

Number of Ports Supported: 1 Transmission Mode: Half-Duplax, Full-Duplex

Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bos

Code Conversion: Ascii to Ascii Features: Reads Floppy Disk, WP,

Price: \$12,900 to \$15,900 Distribution Method: OEM Number Installed to Date: 100 - 500 Date First installed: 1982 (See Vendor Profile Page V-17)

J B M ELECTRONICS ASYNCHRONOUS PROTOCOL

Conversion, Protocol Conversion, Speed Conversion Number of Ports Supported: 16 Transmission Mode: Full-Duplex Standard Transmission Rate Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebcdic,

Ebcdic to Ascii Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: 3275

Synchronous to Asynchronous, 3270 SNA to Asynchronous Features: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Autoanswer Price: \$995

Distribution Method: Third-party

ber Installed to Date: 500 -1,000 **Date First Installed: September** 

(See Vendor Profile Page V-17)

KAUFMAN RESEARCH MANUFACTURING, INC.

MODEL 870 Conversion Function: Code Conversion, Protocol Conversion, Number of Ports Supported: 8 Transmission Mode: Full-Duplex, Block Mode Operation Standard Transmission Rate: Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 9,600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps. 19,200 bps Code Conversion: Ascii to Ebodio Protocol Conversion: Ascil to IBM

3270 BSC Features: Concentration, Polling, Automatic Data Rate Detection,

Price: \$3,395 to \$8,295 Monthly Maintenance Fee: \$85 Distribution Method: End user. OEM, Third-party Number Installed to Date: 100 - 500 Date First Installed: January 1980

(See Vendor Profile Page V-17)

KAUFMAN RESEARCH

MODEL 871 Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion, Emulator imber of Ports Supported: 8 ansmission Mode: Full-Duplex, Block Mode Operation Standard Transmission Rate: Asynchronous - 75 bps, 110 bps. 300 bps, 600 bps, 9,600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bos, 19,200 bos Code Conversion: Ascii to Ebodic Protocol Conversion: Ascii to Sperry

Features: Concentration, Polling, Automatic Data Rate Detection. Autoanswer Price: \$3,395 to \$8,295 Monthly Maintenance Fee: \$85 Distribution Method: End user.

OEM, Third-party Number Installed to Date: 100 - 500 Date First Installed: January 1980

KAUFMAN RESEARCH MANUFACTURING, INC. MODEL 872 Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion, Emulator

# Here are a few good reasons why you should make Local Data your protocol converter company.

Local Data's comprehensive line of local and remote protocol converters have been used around the world to make async-to-IBM communications simple and economical.

DATALYNX™/3274. DataLynx™/3274

remote async ASCII protocol converter supports SNA/SDLC or

BSC protocols. 80 types of ASCII async terminals can emulate IBM 3278 display stations. RS-232C ASCII async printers can emulate IBM 328X printers.

DATALYNX™/3780.

DataLynx™/3780 async ASCII-to-IBM 3780, 2780, 2770 and 3741 protocol converter supports EBCDIC BSC protocol on one channel and async ASCII devices on the other two channels. Features include transparency, mini/micro support and free file transfer program.

INTERLYNX™/3278.

InterLynx™/3278 allows the attachment of



low-cost ASCII CRT terminals or p.c.'s to 3274/3276/4701 and 43XX integrated adaptor Type "A" coax ports. InterLynx/3278 enables the user to use async CRT's on IBM systems and switch to async applications under terminal control.

FILELYNX™/3278.

For micro-mainframe

file transfers. INTERLYNX™/3287.

InterLynx "/3287 allows attachment of ASCII printers to IBM Type "A" coax ports or 3274/3276/4701 controller and 4321/4331 CPU's.

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# Converters/Emulators

Number of Ports Supported: 8 Transmission Mode: Full-Duplex. Block Mode Operation Standard Transmission Rate Asynchronous - 75 bos. 110 bos. 300 bos. 600 bos. 9.600 bos: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps, 19,200 bps Code Conversion: Ascii to Ebodic Protocol Conversion: Ascii to 3270 SNA/SDLC Feetures: Concentration, Polling, Automatic Data Rate Detection. Price: \$3,395 to \$8,295 Monthly Maintenance Fee: \$85 Distribution Method: End user. OEM, Third-party Number installed to Date: 100 - 500 Date First Installed: January 1980

KNIW SYSTEMS CORP. 2780/3780 Conversion Function: Interface

Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 3 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 110 bos. 300 bos. 3,600 bos. 4,800 bos. 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic to Ascii. Ebcdic to Binary, Ebcdic to Card Punch Synchronous to Async, RS-232 Synchronous to Printer, RS-232 Synchronous to Card Reade de Conversion: From Full-Duplex to Half-Duplex, Full to Full Protocol Conversion: BSC to Asynchronous Ascii Features: Concentration, Data Compression, Diagnostics, Polling. Automatic Data Rate Detection. Automatic Parity Recognition, Autoane Price: \$1,995 Monthly Maintenance Fee: \$1 Distribution Method: Third-party Firmber Installed to Date: 100 - 500 Date First Installed: 1978 (See Vendor Profile Page V-17)

#### KMW SYSTEMS CORP.

3770 Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion Emulator Number of Ports Supported: 8 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps. 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic SNA/SDLC to Asynchronous Asoli, Ebcdic to Binary, Ebcdic to 2780/3780 Interface Conversion: RS-232 Synchronous to RS-232

Asynchronous, RS-232 Synchronous

#### Date First Installed: 1981 KMW SYSTEMS CORP. 3777 SERIES II

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 8 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmission Rate Synchronous - 110 bps, 300 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic to Ascii. Ascii to Ebodio Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: SNA/SDLC Ebcdic to Asynchronous Ascii Features: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$4,550 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: 1979

#### KMW SYSTEMS CORP.

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 8 Standard Transmission Rate: Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic to Ascii, Ebcdic to Binary Interface Conversion: RS-232 to Synchronous, RS-232 to Ascii, RS-232 Synchronous to Parallel Async Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: Synchronous Ebcdic to Asynchronous Ascii, Synchronous Ebcdic to Asynchronous Printer, Synchronous

Features: Concentration, Data

Compression, Diagnostics, Polling,

Ebcdic to Binary

Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$4,550 Monthly Maintenance Fee: \$1 Distribution Method: Third-party Number Installed to Date: 100 - 500 Date First Installed: 190

DATALYNX 3274 Conversion Function: Protocol Conversion Number of Ports Supported: 10 Full-Duplex Standard Transmission Ret Asynchronous - 110 bos, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebodic. Ebcdic to Ascii Protocol Conversion: BSC to Asynchronous, SNA/SDLC to Asynchronous Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Autoanswer, Auxiliary Printer Price: \$6,000

Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: 1900 (See Vendor Profile Page V-18) LOCAL DATA, INC. DATALYNK 3780 Conversion Function: Protocol

Conversion

Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Asio to Ebodic, Ebodic to Ascil Mode Conversion: Half-Duplex to

Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: Asynchronous to BSC Features: Diagnostics, Polling, Autoanswer, Transparancy, Prompt

Node Price: \$1,750 Distribution Method: End user Number Installed to Date: 500 -1,000 Date First Installed: September

1980

LOCAL DATA, INC.
INTERLIVAX 3278
Conversion Function: Protocol
Conversion
Number of Ports Supported: 3
Transmission Mode: Full-Duplex
Standard Transmission Rate:
Asynchronous - 110 bps, 300 bps,
600 bps, 1,200 bps, 1,800 bps,
6,200 bps, 3,600 bps, 4,800 bps,
7,200 bps, 9,600 bps
Code Conversion: Assi to Ebcdic
Interface Conversion: RS-232C to
IBM Type-A Coax

Mode Conversion: Half-Duplex to Full-Duplex Protecol Conversion: IBM Type-A to Asynchronous Features: Diagnostics, Automatic Data Rate Detection, Autoanswer, 50 Terminal Types Price: \$1,395 Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: April 1983

LOCAL DATA, INC. INTERLYNX 3287 Conversion, Protocol Conversion Number of Ports Supported: 3 Transmission Mode: Half-Duplex. Full-Duple Standard Transmission Rate Asynchronous - 110 bos. 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps. 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebcdic Interface Conversion: Asynchronous to IBM Type-A Mode Conversion: From Half-Duplex to Full-Duplex Protocol Conversion: BSC/SNA to itures: Diagnostics, Supports RS-232C Centronics Price: \$1,750 Distribution Method: End user Number installed to Date: Under

MICOM SYSTEMS, INC. MICRO800/X.25 CONCENTRATOR PAD

Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion
Number of Ports Supported: 24
Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps. 75 bps. 110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 4,800 bps. 19.200 bps: 9.600 bps Code Conversion: 5-, 6-, 7-, 8-Bit to X.25 8-Bit Character Mode Conversion: Full-Duplex to Full-Duplex Protocol Conversion: Asynchronous to X.25, HDLC to X.25 Features: Concentration, Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer, Full Support of CCITT X.3, X.28, X.29 Price: \$2,050 to \$4,600 Distribution Method: Third-party Number Installed to Date: 500 -1.000 Date First Installed: September (See Vendor Profile Page V-19)

MICOM SYSTEMS, INC. MICRO7400 PROTOCOL CONVERTER Number of Ports Supported: 12 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bos. 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascil to Ebodic Protocol Conversion: Ascil to 3270 BSC, Ascil to 3270 SNA Features: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Autoanswer, 3270 Terminal Simulation Price: \$1,650 to \$4,750 Ibution Method: Third-party ber installed to Date: Under Date First Installed: January 1984

MICROLOG, INC. BABYTALK Conversion Function: Code Conversion, Emulator Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Dursley Standard Trans Asynchronous/Synchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps ion: Ascii to Ebodic, Ebodic to Ascii Interface Conversion: RS-232 to CCITT V.21, RS-232 to CCITT V.23 Features: Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$895 ution Method: End user, OEM, Third-party Number Installed to Date: 500 -(See Vendor Profile Page V-19)

**MIDWEST DATA SOURCE** Conversion, Protocol Conversion, Emulator Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Full-Duplex Standard Trace Synchronous - 75 bps, 3,600 bps Code Conversion: Burroughs to Teletype Protocol Conversion: Burroughs to Teletype Features: Diagnostics, Polling, Automatic Parity Recognition Price: \$695 to \$1,500 (See Vendor Profile Page V-20)

MIDWEST DATA SOURCE Conversion Function: Interface Conversion, Protocol Conversion, Emulator Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Full-Dunley adard Tran Synchronous - 75 bps, 3,600 bps erface Conversi on: Burroughs to ocol Conversion: Burroughs to Teletype

Features: Diagnostics, Polling. Automatic Parity Recognition Price: \$895 to \$1.500 MIDWEST DATA SOURCE

Conversion Function: Interface Conversion, Protocol Conversion, Emulator

Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate

Synchronous - 75 bps, 3,600 bps Interface Conversion: Burroughs to Toletype ocol Conversion: Burroughs to Teletype Features: Diagnostics, Polling, Automatic Parity Recognition

Price: \$140 to \$1,200 MODEMS PLUS, INC.

BRITE ONE Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 3 Transmission Mode: Half-Duplex, Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascil to BSC Interface Conversion: RS-232C to Parallel, RS-232C to RS-232C

de Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: Burroughs to Ascii

Features: Data Compression, Diagnostics, Polling, Autoanswer Price: \$1,280
Monthly Maintenance Fee: \$10
Distribution Method: Third-party
Number Installed to Date: 500 -1.000 Date First Installed: June 1981 (See Vendor Profile Page V-20)

MODEMS PLUS, INC. SMRTE ONE

Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 5 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to BSC, Ascii to SDLC, BSC to SDLC face Conversion: RS-232C to NRZI, RS-232C to Parallel Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: IBM BSC to

IBM SDLC, Ascii to SDLC Feetures: Concentration, Data Compression, Diagnostics, Polling, Price: \$3,900 Monthly Maintenance Fee: \$25 Distribution Method: Third-party Number Installed to Date: Under 100

Date First Installed: June 1983 NATIONAL COMPUTER PROTOCOL CONVERTER Conversion Function: Interface Conversion, Code Conversion, Speed Conversion, Emulator Number of Ports Supported: 4 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps, 600 bps 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, Code Conversion: Asynchronous to Poll/Select Interface Conversion: Interface Conversion: Asynchronous to Poll/Select

Mode Conversion: Half-Duplex to Full-Duplex, Duplex to Half-Duplex col Conversion: Asynchronous Peatures: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity

Price: \$1,500

Distribution Method: End user Date First Installed: June 1984 (See Vendor Profile Page V-21) NESTAR SYSTEMS, INC.

3270 BSC Conversion Function: Emulator Number of Ports Supported: 16 Transmission Mode: Half-Duplex Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ebodic to Asoli Features: Concentration, Data Compression, Diagnostics, Polling Price: \$3,000

Distribution Method: End user Date First Installed: August 1983 (See Vendor Profile Page V-21)

MESTAR SYSTEMS, INC. 3270 SNA Conversion Function: Emulator Number of Ports Supported: 32 Transmission Mode: Full-Duplex Standard Transmission Rate: Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ebcdic to Ascii Features: Concentration, Data Compression, Diagnostics, Polling Price: \$4,000 Distribution Method: End user

HORTHERN TELECOM, INC.

Conversion Function: Interface Conversion, Code Conversion,

Protocol Conversion, Speed Conversion
Number of Ports Supported: 2
Transmission Mode: Full-Ouplex
Standard Transmission Rate:
Asynchronous/Synchronous - 110 bos, 300 bos, 600 bos, 1,200 bos, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps; 4,800 bps, 7,200 bps, 9,600 bps; Synchronous - 19,200 bps Code Conversion: Ebodic to Ascil, Ascil to Ebodic Protocol Conversion: HDLC/X.25/BSC to HDLC/X.25/BSC Platures: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition Distribution Method: End user, OEM Number Installed to Date: Under Date First installed: November 1983 (See Vendor Profile Page V-22)

NORTHERN TELECOM, INC. Number of Ports Supported: 64 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission R Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps; Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56,000 PC-XT to NT SL-1 otocol Conversion: Ascii to IBM 3270 Date First Installed: 1980

NU DATA CORP. 720 PROTOCOL CONVERTER Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 4 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps 19,200 bps Code Conversion: Baudot to Ascil, Ascil to Baudot Interface Conversion: Baudot to ASCN, Ascii to Baudot Features: Diagnostics Price: \$2,000 Distribution Method: End user Number installed to Date: Under Date First installed: 1983 (See Vendor Profile Page V-22)

PERIPHERAL TECHNOLOGY, INC. Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 25 Transmission Mode: Half-Duplex,

# Converters/Emulators

Asynchronous/Synchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1.800 bps. 2.400 bps. 3.600 bps. 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Ebodio Interfece Conversion: BS-232C to BS-422

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex
Protocol Conversion: Ascii to BSC,

Ascii to SNA Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition,

Autoanswer, Password Protection Price: \$995 Prior: \$355 Distribution Method: OEM Flumber installed to Date: 100 - 500 Date First installed: 1982 (See Vendor Profile Page V-23)

PERIPHERAL TECHNOLOGY.

SCAT 1 Conversion Function: Protocol Conversion

Number of Ports Supported: 1 Transmission Mode: Half-Duplex.

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Ebodic, Ebcdic to Ascii

Protocol Conversion: Ascii to Bisynchronous, Ascii to SNA Features: Data Compression, Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition

Distribution Method: Third-party Number Installed to Date: Under **Date First Installed: September** 

Price: \$795

PERIPHERAL TECHNOLOGY.

SCAT 2 2101 Conversion Function: Protocol Conversion Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200

bps, 9,600 bps Code Conversion: Ascii to Ebodic, Ebodic to Ascii Protocol Conversion: Ascii to Bisno.

Ascii to SNA Festures: Data Compres Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition

Price: \$995 Distribution Method: Third-party Humber Installed to Date: Under Date First Installed: January 1982

PERIPHERAL TECHNOLOGY.

SCAT 2 2303 Conversion Function: Protocol Conversion Number of Ports Supported: 6 Transmission Mode: Half-Duplex

Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bos. 75 bos. 110 bos. 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400

bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Ebodic, Ebodic to Ascii Protocol Conversion: Ascii to Bisynchronous, Ascii to SNA

etures: Concentration, Data Compression, Diagnostics, Automatic Data Rate Detection, **Automatic Parity Recognition** Price: \$2,995

Distribution Method: Third-party Number Installed to Date: Under Date First Installed: January 1982

PERIPHERAL TECHNOLOGY.

INC. SCAT 2 2501 Conversion Function: Protocol Conversion

Number of Ports Supported: 5 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bos, 3,600 bos, 4,800 bos, 7,200 bos. 9,600 bos. Code Conversion: Ascii to Ebodic,

Ebcdic to Ascii **Protocol Convers** Bisynchronous, Ascii to SNA Feetures: Concentration, Data Compression, Diagnostics, Automatic Data Rate Detection, **Automatic Parity Recognition** 

Price: \$2,995 Price: \$2,990 Distribution Method: Third-party Number Installed to Date: 100 - 500 Date First Installed: January 1982

Price: \$8,000 T-COMM Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed 100

Conversion, Emulator **Number of Ports Supported: 416** Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps

Code Conversion: Ebodic to Ascii, Ascii to Ebodic Interface Conversion: User Selectible Mode Conversion: From Half-

**Duplex to Full-Duplex** Protocol Conversion: User

eatures: Concentration, Data Compression, Diagnostics, Polling, Automatic Parity Recognition, Autoanswer, Autodial Diatribution Method: End user Number Installed to Date: Under 100

Date First installed: January 1974 (See Vendor Profile Page V-23)

PERSONAL MICROCOMPUTERS MICRO-MET

Number of Ports Supported: 2 Transmission Mode: Full-Duplex Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps,

19,200 bps Price: \$995 Distribution Method: End user, OEM Number Installed to Date: 500 -

Date First installed: April 1983 (See Vendor Profile Page V-23)

PHOENIX DIGITAL CORP.

Conversion Function: Interface Conversion, Protocol Conversion, Speed Conversion, Emulator, Protocol to Protocol

Number of Ports Supported: 16 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmiss Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600

bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conver Asynchronous/Bisynchronous to Modicon, GE to Modicon, GE to Asynchronous/Bisynchronous

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition,

Autoanswai Monthly Maintenance Fee: \$35 Distribution Method: OEM Number Installed to Date: Under

Date First Installed: February 1980 (See Vendor Profile Page V-23)

PHONE 1, INC. **CLEO 3270** 

Conversion Function: Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 9 Transmission Mode: Half-Duplex ndard Transmission Rate Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebodic to Ascil

Interface Conversion: RS-232C to RS-232C Mode Conversion: Half-Duplex to

Full-Duplex Protocol Conversion: 3276/2 to Full-**Duplex Ascii** 

Features: Diagnostics, Autoanswer Price: \$3,995 Price: \$3,995
Distribution Method: End user
Number Installed to Date: 100 - 500
Date First Installed: 1981
(See Vendor Profile Page V-24)

CLEO 3270 H

Conversion Function: Protocol Conversion Number of Ports Supported: 8 Transmission Mode: Half-Duplex Standard Transmission Rate:

Synchronous - 1,200 bps, 1,800 bps, 400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ebodic to Ascil Interface Conversion: RS-232 to

Mode Conversion: Straight Half-Protocol Conversion: 3270/2 to

Ascii Price: \$3,995 Distribution Method: End user, OEM Number Installed to Date: Under

Date First Installed: December 1981

**CLEO 3270 HF** Conversion Function: Protocol

Conversion Number of Ports Supported: 8 Transmission Mode: Half-Duplex Standard Transmission Rate: Synchronous - 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ebodic to Ascil Interface Conversion: RS-232 to

RS-232 Mode Conversion: Straight Half-

Duplex Protocol Conversion: 3271/12 to Ascii

Price: \$3,995 Distribution Method: End user, OEM Number Installed to Date: Under

Date First Installed: January 1983 PROGRESSIVE SYSTEMS,

CLC MODELS 2/4 Conversion Function: Protocol Conversion

Number of Ports Supported: 14 Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19.200 bps Code Conversion: Baudot to Ascii, Ascii to Baudot, Ebodic to Ascii

Protocol Conversion: Telex to Ascii, TWX to Ascii, DDP to Ascii Features: Data Compression, Diagnostics, Automatic Parity Recognition, Autoanswer, for Tandem and IBM Computer

Price: \$3,500 to \$15,000 bution Method: End user per installed to Date: Under 100

Date First Installed: January 1978 (See Vendor Profile Page V-24)

#### PROGRESSIVE SYSTEMS,

CLC MODEL 5 Conversion Function: Protocol Conversion

Number of Ports Supported: 20 Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bos

Code Conversion: Baudot to Ascii, Ascii to Baudot, Ebcdic to Ascii col Conversion: Telex to Ascii, TWX to Ascii, DDP to Ascii Features: Concentration, Data Compression, Diagnostics, Automatic Parity Recognition, ver for Tandem Computers Autoans Price: \$4,000 to \$16,000 Distribution Method: End user Number Installed to Date: Under

Date First Installed: January 1984 PROTOCOL COMPUTERS, INC.

71B/SNA Conversion Function: Protocol

Conversion Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rat Synchronous - 300 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps of Conversion: BSC 3271 to SNA/SDLC 3274 Features: Polling Price: \$3,100 to \$7,000 Monthly Maintenance Fee: \$35 Distribution Method: End user,

OEM, Third-party Number installed to Date: Under 100 Date First Installed: January 1983 (See Vendor Profile Page V-24)

PROTOCOL COMPUTERS, INC. 73SX

Conversion Function: Protocol Conversion

Number of Ports Supported: 3 Transmission Mode: Full-Duplex Asynchronous - 300 bps; Asynchronous/Synchronous - 1,200 bps; 2,400 bps, 4,800 bps, 9,600 bos

Protocol Conversion: X.25 to SDLC Features: Diagnostics, Polling Monthly Maintenance Fee: \$55 Distribution Method: End user, OEM, Third-party Number Installed to Date: Under 100

Date First Installed: April 1983

PROTOCOL COMPUTERS, INC. 74D

Conversion Function: Protocol Conversion

Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600

Code Conversion: Ebodic to Ascii Protocol Conversion: SNA/SDLC to

Features: Polling, Autoanswer Price: \$5,200 Monthly Maintenance Fee: \$35 Distribution Method: End user, OEM, Third-party

per Installed to Date: Under 100 Date First Installed: October 1983

ROTOCOL COMPUTERS, INC.

Conversion Function: Protocol

Conversion
Number of Ports Supported: 8
Transmission Mode: Full-Duplex
Installan Rate: Synchronous - 1,200 bps, 2,400 bps, 4.800 bps, 9,600 bps ol Conversion: 3270 BSC to

Price: \$3,100 to \$7,000 Monthly Maintenance Fee: \$35 Distribution Method: End user. OEM, Third-party Number Installed to Date: Under 100 Date First Installed: December 1983

PROTOCOL COMPUTERS, INC. 1061 CONVERTER Conversion Function: Protocol Conversion imber of Ports Supported: 7 snemission Mode: Full-Duplex



### Let MTI connect you to the low-cost ASCII world with protocol converters from PCI (and let your PC talk with your mainframe, too).

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# Converters/Emulators

Standard Trensenteelon Rate:
Asynchronous - 300 bps;
Asynchronous - 300 bps;
Asynchronous - 300 bps, 2,400 bps, 2,400 bps, 4,800 bps, 9,600
bps
Protocol Conversion: SNA/SDLC to Accil
Feetures: Diagnostics, Polling,
Automatic Data Rate Detection,
Automatic Data Rate Detection,
Automatic Data Rate Detection,
Automatic Data Rate Detection,
Automatic Parity Recognition
Price: \$3,100 to \$7,000
Bloothly Misintenance Fee: \$30
Distribution Method: End user,
CEM, Third-party
Number Installed: November 1982

PROTOCOL COMPUTERS, INC. 1067 CONVERTER Conversion Function: Protocol Conversion Number of Ports Supported: 7 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bos Protocol Conversion: Ascii to SNA/SDLC (PU1) Feetures: Polling, Automatic Data Rate Detection Price: \$3,100 to \$7,000 Monthly Maintenance Fee: \$30 Distribution Method: End user, OEM, Third-party Number installed to Date: 100 - 500 Date First Installed: September

PROTOCOL COMPUTERS, NMC.
1071 CONVERTER
Conversion Function: Protocol
Conversion Mumber of Ports Supported: 7
Transmission Moder Full-Duplex
Standard Transmission Fatte:
Asynchronous-300 bps;
Asynchronous-900 bps;
Asynchronous-900 bps;
Asynchronous-900 bps;
Asynchronous-900 bps;
Baynchronous-900 bps;
Asynchronous-900 bps;
Asynchronous-900 bps;
Asynchronous-900 bps;
Asynchronous-1000 bps;
Asynchronous-900 bps;
Baynchronous-900 bps;
Baync

1979

PROTOCOL COMPUTERS, INC.
1076 CONVERTER
Conversion Function: Protocol
Conversion, Emulator
Number of Ports Supported: 8
Transmission Mode: Ful-Duplox
Standerd Transmission Rate:
Asynchronous - 300 bps;
Asynchronous/Synchronous - 1,200
bps, 2,400 bps, 4,800 bps, 9,600
bps
Code Conversion: Ebodic to Ascii
Protocol Conversion: Asoli to
SNA/SDLC 3274-6
Feetures: Diagnostics, Polling,
Automatic Data Rate Detection,

Price: \$3,100 to \$7,000 Monthly Meintenance Fee: \$30 Detribution Method: End user, OEM, Third-party Number installed to Date: 500 -1,000 Date First Installed: September 1980

PROTOCOL COMPUTERS, INC. 1076X CONVERTER Conversion Function: Protocol Conversion, Emulator Humber of Ports Supported: 7 Standard Transmission Rate: Standard Transmiss Asynchronous - 300 bps; Asynchronous/Synchronous - 1,200 bps, 2,400 bps, 4,800 bps, 9,600 Protocol Conversion: Ascii to 3270 SNA/SDLC Features: Diagnostics, Polling, Automatic Data Rate Detection Price: \$4,600 to \$8,500 fonthly Maintenance Fee: \$30 Distribution Method: End user, OEM, Third-party Number Installed to Date: Under Date First Installed: April 1983

PROTOCOL COMPUTERS, INC. 3780/SNA
Conversion Function: Protocol Conversion
Number of Ports Supported: 1
Transmission Mode: Ful-Duplex
Standard Transmission Rate:
Asynchronous-300 bps:
Asynchronous-3

PROTOCOL COMPUTERS, INC.

Conversion Function: Code

Conversion, Protocol Conversion,

Number of Ports Supported: 8 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 300 bps; Asynchronous/Synchronous - 1,200 bps; 2,400 bps, 4,800 bps, 9,600 Code Conversion: Ascil/BSC 3270 to Ascii/SNA 3767, Ascii/SNA 3270 to 3780/SNA 3770, Ascil/SNA 5251 to 3270 BSC/SNA Protocol Conversion: Asol/BNS 3270 to Ascii/SNA 3767, Ascii/SNA 3270 to 3780, Ascii/SNA 5251 to 3270 BSC/SNA Feetures: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Autoanswer, Dynamic Printer Assignment Price: \$1,850 to \$8,500

Monthly Maintenance Fee: \$40 Distribution Method: End user, OEM, Third-party Number Installed to Date: 500 -1,000 Date First Installed: August 1980

PROTOCOL COMPUTERS, INC.

NT3SX CONVENTER
Conversion Function: Protocol
Conversion Function: Protocol
Conversion
Number of Ports Supported: 5
Standard Transmission Rate:
Asynchronous - 300 bps;
Asynchronous/Synchronous - 1,200
bps, 2,400 bps, 4,800 bps, 9,800
bps
Protocol Conversion: SDLC to X.25
Features: Diagnostics, Polling
Price: \$5,500
Monthly Maintenance Fee: \$55
Distribution Method: End user,
CEM, Third-party
Number Installed: Dozember 1983
PROTOCOL COMPUTERS, INC.
VIDROTEK C.
Conversion Function: Protocol
Conversion
Number of Ports Supported: 7
Transmission Mode: Eid-Indire

Number of Ports Supported: 7
Transmission Mode: Full-Duplex
Standard Transmission Rote:
Asynchronous -75 bps, 300 bps,
Asynchronous -1,200
bps, 2,400 bps, 9,600
bps
Protocol Conversion: Ascil to
SNM/SDLC
Festures: Poling
Price: \$3,100 to \$7,000
Monthly Maintenance Fee: \$35
Distribution Method: End user,
OEM, Third-party

QUASITRONICS, INC. Conversion Function: Protocol Conversion Number of Ports Supported: 1 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Digital Command Protocol Conversion: Serial to Qume Features: Diagnostics, Automatic Parity Recognition, Autoenswer Distribution Method: End user Date First Installed: January 1984 (See Vendor Profile Page V-24)

QUASITRONICS, INC.
STI
Conversion Function: Protocol
Conversion
Number of Ports Supported: 1
Standard Transmission Rate:
Asynchronous - 110 pps, 300 bps,
600 bps, 1,200 bps, 1,800 bps,

2,400 bps, 3,600 bps, 4,600 bps, 7,200 bps, 9,600 bps,

RACAL-TELLESYSTEMS, INC.
202 NETWORKING TRANSLATOR
Conversion Functions Protocol
Conversion
Number of Ports Supported: 2
Transmission Mode: Half-Duplex,
Fal-Duplex
Standard Transmission Rate:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,500 bps,
4,800 bps
Protocol Conversion: Word
Processor to Word Processor
Festaresc Diagnostics, Automatic
Data Rate Detection, Automatic
Data Rate Detection, Automatic
Parily Recognition
Price: \$2,995
Monthly Maintenance Fee: \$33
Distribution Method: End user
Number Installed to Date: 100 - 500
Date First Installed to Date: 100 - 500
Date First Installed: February 1986
(See Vendor Profile Page V-29)

RACAL-TELES YSTEMS, INC.
404 CENTRAL SITE TRANSLATOR
Conversion Function: Protocol
Conversion
Number of Ports Supported: 2
Transmission Mode: Half-Duplex,
Full-Duplex,
Full-Duplex
Standard Transmission Rates.
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps,
4,800 bps
Protocol Conversion: Word
Processor to Word Processor
Protocol Conversion: Word
Processor to Word Processor
Features: Disgnostics, Automatic
Data Rate Detection, Automatic
Parity Recognition
Price: \$3,995
Monthly Maintenance Fee: \$33
Distribution Methods: End user
Number Installed to Date: 100 - 500
Date First Installed: February 1983

RADIAN CORP.
MP-III
Conversion Function: Protocol
Conversion
Transmission Mode: Half-Duplex,
Full-Duplex
Features: Remote Batch
Price: \$4,100 to \$20,000
Monthly Maintenance Fee: \$200
Distribution Method: End user
Number Installed to Date: Under
100
(See Vendor Profile Page V-25)

RENEX CORP. TRANSLATOR-3270 Conversion Function: Protocol Conversion Number of Ports Supported: 32 Transmission Mode: Half-Duplex, Full-Dublex

Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 600 bps, 1,800 bps, 3,600 bps, 7,200 bps;

Asynchronous/Synchronous - 300 bps, 1,200 bps, 2,400 bps, 4,800 bps, 9,600 bps Protocol Conversion: Ascil to 3270 SNA/SDLC, Ascil to 3270 BSC, Ascil

System/38
Features: Diagnostics, Automatic
Data Rate Detection
Price: \$3,600 to \$15,000
Monthly Maintenance Fee: \$67
Distribution Method: Third-party
Number Installed to Date: 500 -

to System/34, System/36.

1,000

Date First Installed: September 1980
(See Vendor Profile Page V-25)

# SHAFFSTALL CORP. MEDIACOM Conversion Function: Protocol

Conversion Function: Protocol
Conversion
Number of Ports Supported: 1
Transmission Mode: Half-Duplex,
Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bpe, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps

Code Conversion: Ascil to Ebodic Protocol Conversion: Asynchronous to Bisynchronous, Bisynchronous to Asynchronous

Asynchronous Features: Diagnostics, Autoanswer Price: \$5,500

Distribution Method: End user Number Installed to Date: 100 - 500 Date First Installed: June: 1980 (See Vendor Profile Page V-26)

# SHERWOOD DIGITAL

A/S-2, A/S-3
Conversion Function: Interface
Conversion, Code Conversion,
Protocol Conversion, Speed
Conversion, Emulator
Number of Ports Supported: 1
Transmission Mode: Half-Duplex,
Full-Duplex
Standard Transmission Rate:

Asynchronous/Synchronous - 2,400 bps, 9,600 bps Code Conversion: Ebodic to Ascil, Ebodic to Baudot Interface Conversion: RS-232 to

RS-232 Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion:
Bisynchronous Ebodic to Ascil
Asynchronous, Ebodic
Bisynchronous to Baudot-Telex
Features: Data Compression,
Diagnostics, Polling, Autoanswer
Price: \$1,495 to \$2,495
Distribution Method: Third-party
Number Installed to Date: 1,000 5,000

Date First installed: March 1978 (See Vendor Profile Page V-26)

#### SHERWOOD DIGITAL ELECTRONICS PQ4, PQ5

Conversion Function: Protocol Conversion Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Duplex

Full-Duplex
Full-Duplex
Standard Transmission Rate:
Asynchronous - 110 bps, 300 bps, 600 bps, 1,800 bps;

Asynchronous/Synchronous - 1,200 bps; 2,400 bps, 4,800 bps, 9,800 bps Code Conversion: Ebcdic to

Baudot, Ascil to Ebcdic, Ascil to Baudot Interface Conversion: IBM TWX-AX to RS-232

Protocol Conversion: SNA/SDLC TWX to Ascil-Asynchronous Features: Diagnostics, Polling, Autoanswer Price: \$1,495 to \$2,495 Distribution Method: Third-party Number installed to Date: 500 -

Number installed to Date: 500 -1,000 Date First installed: March 1978

### STARNET DATA SYSTEMS

STARNET II
Conversion Function: Interface
Conversion, Code Conversion,
Protocol Conversion, Speed
Conversion, Dissimilar Protocols.
Number of Ports Supported: 16
Transmission Mode: Half-Duplex,
Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 19,200 bos

Code Conversion: Ascii to Binary, Ascii to Hex, Ascii to Ascii II Interface Conversion: RS-232 to V.35

Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: INC AK to DCI DC2, CTS RTS to DCII DC3, XON XOF to ENQ ANK Features: Dicanostics, Autoanswer.

Features: Diagnostics, Autoanswer Modem Facility, Autodial, Autoanswer Price: \$14,710 Distribution Method: End user Number Installed to Date: Under

100 Date First Installed: 1981 (See Vendor Profile Page V-28)

#### STRATUS COMPUTER, INC. STRATUS/32 CONTINUOUS

PROCESSING SYSTEM Conversion Function: Protocol Conversion, Speed Conversion Number of Ports Supported: 32 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ebcdic to Ascii, Ascil to Ebcdic Interface Conversion: RS-232 to RS-422, RS-422 to RS-232 Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Parity Recognition,

Autoanswer Price: \$140,000 Distribution Method: End user Number Installed to Date: Under

Date First Installed: February 1982 (See Vendor Profile Page V-28)

# SYNALTA SYSTEMS

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 3 Transmission Mode: Half-Duplex,

Fall-Outpiex Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 2,400 bps, 3,800 bps, 4,800 bps, 7,200 bps, 9,800 bps, 1,800 bps, 9,800 bps, 19,200 bps Code Conversion: Ascii to Ebodic, Ebodic to Ascii

Interface Conversion: Serial to Parallel, Parallel to Serial Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex

Protocol Conversion: BLC to HDLC, SDLC to BDLC Features: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Automasswer

Price: \$495 Monthly Maintenance Fee: \$25 Distribution Method: End user, OEM Number Installed to Date: 100 - 500 Date First Installed: January 1983 (See Vendor Profile Page V-28)

#### SYNALTA SYSTEMS STD SER 2

STD SER 2
Conversion Function: Interface
Conversion, Code Conversion,
Protocol Conversion, Speed
Conversion, Emulator
Number of Ports Supported: 3
Transmission Mode: Half-Duplex,
Full-Duplex
Standard Transmission Rate:
Asynchronous/Synchronous - 50

Standard Transmission Rate:
Asynchronous/Synchronous - 50
bps, 75 bps, 110 bps, 300 bps, 600
bps, 1,200 bps, 1,800 bps, 2,400
bps, 3,600 bps, 1,800 bps, 7,200
bps, 9,600 bps, 19,200 bps
Gode Conversion: Asoli to Ebodic,
Ebodic to Asoli
Interface Conversion: Serial to
Parallel, Parallel to Serial

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: BLC to HDLC.

SDLC to BDLC Feetures: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Automaswer

Price: \$495 Monthly Maintenance Fee: \$25 Distribution Method: End user, OEM Number installed to Date: 100 - 500 Date First Installed: January 1983

#### TANDY CORP

Conversion Function: Protocol Conversion Number of Ports Supported: 7 Standard Transmission Rate: Synchronous - 9,800 bps Code Conversion: Ebodic to Asoli Interface Conversion: Ebodic to Asoli Interface Conversion: SNA/SDLC to Asoli 2 Freatures: Diagnostics, Automatic Features: Diagnostics, Automatic

Features: Diagnostics, Automatic Data Rate Detection, Automatic Parity Recognition Price: \$7,000 Distribution Method: End user

Distribution Method: End user Date First Installed: December 1981 (See Vendor Profile Page V-29)

#### TECHLAND SYSTEMS, INC. BLUE LINX 3275/8 BISYNCH

Conversion Function: Emulato Number of Ports Supported: 1 Transmission Mode: Half-Duplex. Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps; Synchronous - 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to Ebcdic, Fhedic to Ascii Features: Data Compression. Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$690 Distribution Method: End user, OEM, Third-party Number Installed to Date: 100 - 500 (See Vendor Profile Page V-29)

#### TECHLAND SYSTEMS, INC.

BLUE LINX 3276/SDLC
Conversion Function: Emulator
Number of Ports Supported: 1
Transmission Mode: Half-Duplex,
Full-Duplex
Standard Transmission Rete:
4sunchangus/Sunchangus - 1 20

Standard Transmission Rate: Asynchronous - 1,200 bps. 1,800 bps. 2,400 bps: 3,600 bps. 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Asoil to Edodic.

Ebodic to Ascii Pestures: Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoanswer Price: \$690 Distribution Method: End user,

OEM, Third-party Number installed to Date: 500 -1,000 Date First installed: November 1982

TECHLAND SYSTEMS, INC.

BLUE LINX 5251/12 Conversion Function: Emulator Number of Ports Supported: 1 Standard Transmission Rate: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 2,400 bps; Synchronous - 3,600 bps, 4,800 bps,

# Converters/Emulators

7.200 bps, 9,800 bps
Code Conversion: Asoi to Ebodic,
Edodic to Asoi
Features: Data Compression,
Diagnostics, Polling, Automatic Data
Rate Detection, Automatic Parity
Recognition, Automaswer
Price: \$690
Distribution Method: End user,
OEM, Third-party
Number Installed to Date: 500 1,000
Date First Installed: November 1982
Date First Installed: November 1982

TECHLAND SYSTEMS, INC.

Conversion Function: Emulator Number of Ports Supported: 1
Transmission Mode: Helf-Duplex, Full-Duplex, Full-Duplex, Standerd Transmission Rate: Asynchronous/Synchronous - 1,200 bps, 1,800 bps, 1,800 bps, 2,400 bps, 2,000 bps, 2,000 bps, 0,600 bps Code Conversion: Acid to Ebodic, Ebodic to Acid Testing Standard Conversion: Acid to Ebodic, Ebodic to Acid Testing Standard Standard

TEXTRONIX, INC.

Conversion Function: Emulator Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Sunchronous, 75

**Date First Installed: October 1981** 

Standard Transmission Rate: Asynchronous/Synchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Mode Conversion: Half-Duplex to

Mode Conversion: Half-Duplex to Full-Duplex, Full-Duplex to Half-Duplex Protocol Conversion: BSC to X.25, SDLC, SNA

Features: Diagnostics, Polling, Protocol Simulation Price: \$175 to \$3,990 Distribution Method: End user Number installed to Date: 500 -1,000

Date First installed: 1981 (See Vendor Profile Page V-30) TELEBYTE TECHNOLOGIES.

80 Conversion Function: Interface Conversion Number of Ports Supported: 1

Transmission Mode: Full-Duplex Standard Transmission Hats: Asynchronous/Synchronous - 50 bps. 75 bps. 110 bps. 300 bps. 800 bps. 1,200 bps. 1,800 bps. 2,400 bps. 3,600 bps. 4,800 bps. 7,200 bps. 9,600 bps. 19,200 bps. 20,000 bps.

Interface Conversion: RS-232C to

RS-449, RS-449 to RS-232C Features: Automatic Data Rate Detection Price: \$115 Distribution Method: End user Number Installed to Date: Under

100
Date First installed: September
1981
(See Vandor Profile Page V-30)

TELEBYTE TECHNOLOGIES,

Convenion Function: Interface Convenion: Number of Ports Supported: 1 Transmission Mode: Hell-Duplex, Full-Duplex Standard Transmission Rate: Asynchronous/Synchronous-50 bps, 75 bps, 1100 bps, 1,800 bps, 2,400 bps, 3,500 bps, 1,800 bps, 2,400 bps, 3,500 bps, 1,800 bps, 1,800

Current Loop, Current Loop to RS-232C Features: Automatic Data Rate Detection

Price: \$80 Distribution Method: End user Number installed to Date: 100 - 500 Date First installed: September 1982

VELEBYTE TECHNOLOGIES, INC.

Conversion Function: Interface Conversion Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps

Current Loop, Current Loop to RS-232C Features: Automatic Data Rate Detection

Price: \$100 Distribution Method: End user Humber Installed to Date: 500 -

Date First Installed: June 1983

TELEBYTE TECHNOLOGIES, INC.

Conversion Function: Interface Conversion Number of Ports Supported: 2 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate:

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Interface Conversion: RS-232C to Current Loop, Current Loop to RS-

Features: Diagnostics

Price: \$198 Distribution Method: End user Number Installed to Date: Under 100 Date First Installed: June 1983

TELEBYTE TECHNOLOGIES, INC. SERIES 63

Conversion Function: Interface Conversion Number of Ports Supported: 1 Transmission Mode: Full-Duplex,

Control Signals
Standard Transmission Rate:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 900 bps, 1200 bps,
1,800 bps, 2,400 bps, 3,800 bps,
1,800 bps, 7,200 bps, 9,600 bps,
19,200 bps, 100,000 bps
Instracts Conversion: RS-232C to
RS-422, RS-422 to RS-232C

RS422, RS422 to RS-232C Features: Automatic Data Rate Detection Price: \$99 to \$126 Distribution Method: End user Number installed to Date: Under 100 Date First Installed: March 1983

TELEFACE CORP.

Conversion Function: Code
Conversion, Protocol Conversion,
Speed Conversion,
Speed Conversion
Number of Ports Supported: 2
Transmission Mode: Full-Duplex
Standard Transmission Rate:
Asynchronous - 50 bps, 75 bps, 110
bps, 300 bps, 600 bps, 1,200 bps,
1,800 bps, 2,400 bps, 3,600 bps
4,800 bps, 7,200 bps, 9,600 bps
Code Conversion: Asoit to Baudot,
Baudot to Asoil
Features: Disgnostics, Autoanswer,
Fall Back
Price: \$1,385 to \$1,670

Monthly Maintenance Fee: \$24 Distribution Method: End user, OEM, Third-party Number Installed to Date: Under 100 Date First Installed: September

1980 (See Vendor Profile Page V-30)

TELEPROCESSING PRODUCTS, INC. TP-200/201 Number of Ports Supported: 1 Transmission Mcde: Half-Duplex, Simplex

Standard Transmission Rate:
Asynchronous/Synchronous -75
bps, 110 bps, 300 bps, 600 bps,
1,200 bps, 1,800 bps, 2,400 bps,
1,800 bps, 1,800 bps, 2,700 bps,
9,600 bps, 19,200 bps
Protocol Conversion: Asynchronous to
Asynchronous
Asynchronous
Features: Diagnostics

Price: \$295 to \$395 Distribution Method: End user, Third-party Number Installed to Date: 1,000 -5,000

Date First Installed: January 1979 (See Vendor Profile Page V-30) PRODUCTS, INC. TP-200M

Number of Ports Supported: 1 Transmission Mode: Half-Duplex, Simplex Standard Transmission Rate:

Standard Transmission Rate: Asynchronous/Synchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Protocot Cenversation: Asynchronous to Synchronous, Synchronous to Asynchronous

Asynchronous
Features: Diagnostics, Automatic
Parity Recognition, Autoanswer,
Error Control
Price: \$735

Distribution Method: End user, Third-party Number installed to Date: 100 - 500 Date First Installed: May 1981

TELEPROCESSING PRODUCTS, INC.

TP-300
Conversion Function: Interface
Conversion
Number of Ports Supported: 1
Transmission Mode: Half-Duplex,
Full-Duplex

Standard Trensmission Rate: Asynchronous/Synchronous - 50 bps, 75 pps, 110 bps, 300 bps, 800 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 2,000 bps, 9,600 bps, 19,200 bps, 50,000 interface Conversion: R5-232 to 20 mA Current Loop, 20 mA Current

mA Current Loop, 20 mA Current Loop to RS-232 Price: \$450 Distribution Method: End user, Third-party Number Installed to Date: 500 -

1,000 Date First Installed: 1980

TELEPROCESSING PRODUCTS, INC.

TP-350
Conversion Function: Interface
Conversion
Number of Ports Supported: 1
Transmission Mode: Half-Duplex,
Full-Duplex
Standerd Transmission Rate:
Asynchronous/Synchronous - 50
bos, 75 bos, 110 bos, 300 bos, 600

bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56,000 bps interface Conversion: RS-232 to V.35, V.35 to RS-232 Price: \$450

Distribution Method: End user, Third-party Number Installed to Date: 500 -

TELTONE CORP.
M-871 ACCESS CONTROLLER
Conversion Function: Protocol
Conversion
Number of Ports Supported: 25

Transmission Mode: Half-Duplex Standard Transmission Rate: Asynchronous/Synchronous - 300 bps. 1,200 bps. 2,400 bps: Synchronous - 600 bps, 4,800 bps, Code Conversion: Ascii to Ebodic. Ebcdic to Ascii Interface Conversion: RS-232C Protocol Conversion: Ascii to SNA/SDLC, Ascii to BSC Features: Diagnostics, Polling Automatic Data Rate Detection, Automatic Parity Recognition

Distribution Method: End user

Number Installed to Date: Under Date First Installed: October 1983 (See Vendor Profile Page V-30)

#### THOMAS ENGINEERING MZBO Conversion Function: Protocol

Conversion Number of Porta Supported: 32 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 Code Conversion: Ascii to Ebcdic, Ebodic to Ascii Protocol Conversion: Ascii to BSC. Ascii to SDLC, Ascii to VIF Features: Concentration, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition

Distribution Method: End user Number installed to Date: Under Date First installed: December 1981 (See Vendor Profile Page V-30)

Price: \$5,000 to \$12,000

## **TNW 232D**

Conversion Function: Interface Conversion, Code Conversion Number of Ports Supported: 2 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Commodore Ascii Interface Conversion: IEEE/488 to RS-232, RS-232 to IEEE/488 Price: \$369

Price: \$389 Distribution Method: Third-party Humber Installed to Date: 100 - 500 Date First Installed: 1979 (See Vendor Profile Page V-31)

THW CORP. TNW 1000

Conversion Function: Interface

Conversion, Code Conversion mber of Ports Supported: 1 mamission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bos. 75 bos. 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Commdore Ascii rface Conversion: IEEE/488 to BS-232 Price: \$129 Distribution Method: Third-party Number installed to Date: 500 -

1.000 Date First installed: 1980

#### THW CORP. **TRW 2000**

Conversion Function: Interface Conversion, Code Conversion Number of Ports Supported: 1 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Commodore Ascii to Ascii Interface Conversion: IFFF/488 to RS-232, RS-232 to IEEE/488 Price: \$229 Distribution Method: Third-party Number Installed to Date: 500 -

#### Date First Installed: 1981 TRENDATA STANDARD MEMORIES CORP.

TCA/2 Conversion Function: Protocol Conversion Number of Ports Supported: 8 Transmission Mode: Half-Duplex, Full-Duplex Standard Transmission Rate:

Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps Code Conversion: Ascii to BSE

Protocol Conversion: RS-232 to Distribution Method: End user Humber Installed to Date: 500 -

(See Vendor Profile Page V-31)

#### TRI-DATA **NETWAY COMMUNICATIONS** PROCESSOR

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed

Conversion, Emulator Number of Ports Supported: 32 Transmission Mode: Half-Duplex, Full-Duplex

Standard Transmission Rate: Asynchronous/Synchronous - 50 bps, 75 bps, 110 bps, 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps, 56,000

Protocol Conversion: 3270 SNA to Asynchronous Asoli, SDLC to Asynchronous Ascii, 3270 Bisynchronous to Asynchronous Ascli

Features: Concentration, Data Compression, Diagnostics, Polling, Automatic Data Rate Detection, Automatic Parity Recognition, Autoansw Price: \$11,000

Distribution Method: End user, OEM, Third-party Number Installed to Date: Under

Date First Installed: March 1983 (See Vendor Profile Page V-31)

VIA WEST, INC. **CST 100** Conversion Function: Interface Conversion

Number of Ports Supported: 1 Standard Transmission Rate: Asynchronous - 300 bps, 600 bps, 1,200 bos, 1,800 bos, 2,400 bos. 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Interface Conversion: RS-232 to Centronics Parallel Price: \$150 Distribution Method: OEM Number Installed to Date: 500 -

(See Vendor Profile Page V-32)

#### VIA WEST, INC. PSI 100 Conversion Function: Interface

Conversion Number of Ports Supported: 1 Standard Transmission Rate: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Interface Conversion: Centronics Parallel to RS-232 Price: \$200 Distribution Method: OEM Number Installed to Date: Under

VIA WEST, INC. VST 2000 Conversion Function: Interface Conversion

Number of Ports Supported: 1 Standard Transmission Rate: Asynchronous - 300 bps, 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Interface Conversion: RS-232 to Centronics Parallel Features: Diagnostics Price: \$195 Distribution Method: CEM Number Installed to Date: 5,000 -

#### WESTERN DATACOM DATACOM 1000

Conversion Function: Interface Conversion, Code Conversion, Protocol Conversion, Speed Conversion, Emulator Number of Ports Supported: 4 Transmission Mode: Full-Duplex Standard Transmission Rate: Asynchronous - 110 bos. 300 bos. 600 bps, 1,200 bps, 1,800 bps, 2,400 bps, 3,600 bps, 4,800 bps, 7,200 bps, 9,600 bps, 19,200 bps Code Conversion: Ascii to Ebcdic. Ebodic to Ascii Interface Conversion: Software Flow Center to Hardware Flow Center Protocol Conversion: Any

Asynchronous to Other Asynchronous Features: Diagnostics, Autoanswer, Dual-Speed Moderns Price: \$2,000 Monthly Maintenance Fee: \$10 Distribution Method: Third-party Number installed to Date: Under Date First Installed: November 1982 (See Vendor Profile Page V-33)

#### XYQUAD, INC.

X-100 Conversion Function: Protocol Conversion Number of Ports Supported: 5 Transmission Mode: Half-Duplex, Full-Duplex Synchronous - 2,400 bps Code Conversion: Ascii to Ebodic, Ebcdic to Ascii Mode Conversion: Usually Half-Duplex, No Conversion Protocol Conversion: Ascii to SNA/SDLC Features: Diagnostics, Automatic Parity Recognition
Price: \$1,150
Monthly Maintenance Fee: \$13
Distribution Method: End user
Number Installed to Date: Under 100 (See Vendor Profile Page V-33)

# COMMUNICATIONS PROCESSORS

# **Index to Communications Processors**

Often referred to as front-end processors, these systems perform the communications management function between peripheral devices and the host computer. These tasks include line control of the communications circuits, interface control, message formatting and error checking, as well as other functions. The index has been arranged alphabetically by vendor and contains the unit price as well as the page number on which the complete listing can be found.

ENDOR	MODEL PRICE	PA	GE
ACC	IF-11/3780\$8.000	В	-25
	IF-11/HDLC	B	-28
	IF-11Q/X.25 \$9.500		-28
	IF-11/X.25 \$10,000		- 28
	IF-11/X.25 PLUS		-25
	UMC PROCESSOR BOARD \$3,600 to \$12,000		- 25
Access Telecommunications	ACCESS 34-1. \$6,000 to \$25,000		- 25
ADDUSTS Telecommunications			
	ACCESS 36-II		-25
	ACCESS 38		1-25
Lmdahl Corp			1-20
	4705 E		1-26
Amnet, Inc			1-24
Auscom, Inc	MODEL 8911A CHANNEL INTERFACE \$20,000	B	1-20
L. W. Computer Systems, Inc.	A.W. BRIDGE TECH	В	1-26
Betacom Corp.			1-20
Broadband Systems, Inc.			-2
Burroughs Corp.			1.0
surroughs corp			1-24
	CP3680		
	CP9582		3-27
	NSP/LSP N/A		
Century Analysis, Inc	OSI\$11,000		3-27
Chi Corp			3-27
Codex Corp.	CODEX 6520 FEP	B	3-27
Commex. Ltd.			3-27
	CMC-32 \$35,000 to \$65,000		3-27
	DNP-41		
	DNP-6I \$50,000 to \$107,000		
	DNP-16i		2-21
Commtex, Inc			
Computer Communications, Inc			3-21
	CC-8		
	CC-80	)	B-21
	CC-85 \$200,000 to \$500,000	)	3-2
Computer Identics Corp	LDP-5 \$30,000	) 8	2.2
Computer Systems			
Control Data Corn.			3-2
Control Data Corp	2551-4 \$47.863		20
			9-20
Datagram Corp			B-2
Dataprobe, Inc			B-2
Datastream Communication, Inc			B-2
	776		B-31
	874	2	B-3
	MPC \$6,000 to \$12,000	2	9-3
Daycom Corp.			B-3
DCA/TAC			B-3
DOM 180	SYSTEM 355 N/A		B-3
Digital Equipment Corp	ETHERNET COMMUNICATIONS SERVERS N//		
			B-3
			B-3
Engineered Systems, Inc			
Engineered Systems, Inc.  Envax Systems, Inc.	ENVAX 600 \$1,000 to \$3,000	)	
Envex Systems, Inc.	ENVAX 600	)	
	ENVAX 600	)	B-3
Envex Systems, Inc.	ENVAX 600 \$1,000 to \$3,000 TRANSACTION PROCESSOR \$4,000 to \$20,000 EXOS 101 \$1,700	)	B-3 B-3
Envax Systems, inc.  Excelan  Gandalf Data, inc.	ENVAX 600 \$1,000 to \$3,000 TRANSACTION PROCESSOR \$4,000 to \$20,000 EXOS 101 \$1,700 PACK IV. N//	9	B-3 B-3 B-3
Envex Systems, Inc.  Excelan  Gandaif Deta, Inc.  Gateway Communications, Inc.	ENVAX 600 \$1,000 to \$3,000 to \$3,000 to \$20,000 to \$20,	2	B-3 B-3 B-3
Envax Systems, inc.  Excelan  Gandalf Data, inc.	ENIVAX 600 \$1,000 to \$3,000 to \$3,000 to \$20,000 to \$20	2	B-3 B-3 B-3 B-3
Envax Systems, Inc.  Excelan  Gandaif Data, Inc.  Gateway Communications, Inc.  GTE Telenet Communications Corp.	ENVAX 600 \$1,000 to \$3,000 TRANSACTION PROCESSOR \$4,000 to \$20,000 EXOS 101 \$7,000 PACX IV \$0,000 ATTEMP PROCESSOR \$1,500 to \$4,000 TP-3005 NETWORK INTERFACE PROCESSOR \$2,35 TP3010-II NETWORK INTERFACE PROCESSOR \$2,35	0	B-3 B-3 B-3 B-3 B-3 B-3
Envex Systems, Inc.  Excelan  Gandaif Deta, Inc.  Gateway Communications, Inc.	ENVAX 500 \$1,000 to \$3,001 TRANSACTION PROCESSOR \$4,000 to \$20,001 EXOS 101 \$1,701 PACX IV \$1,701 AATEWAY PROCESSOR \$1,560 to \$4,501 TP-3005 NETWORK INTERFACE PROCESSOR \$2,351 TP3010-II NETWORK INTERFACE PROCESSOR \$7,500 HARRIS 1600 \$7,500	0	B-3 B-3 B-3 B-3 B-3 B-3
Envax Systems, Inc.  Excelan  Gandaif Data, Inc.  Gateway Communications, Inc.  GTE Telenet Communications Corp.	ENVAX 600 \$1,000 to \$3,000 TRANSACTION PROCESSOR \$4,000 to \$20,000 EXOS 101 \$4,000 to \$20,000 EXOS 101 \$4,000 to \$20,000 EXOS 101 \$4,000 to \$4,000 to \$40,000 EXOS 101 \$4,000 to \$4,000 EXOS 101 EXTENSIVE PROCESSOR \$1,560 to \$4,500 TP-3005 NETWORK INTERFACE PROCESSOR \$2,350 TP3010-INETWORK INTERFACE PROCESSOR \$7,500 HARRIS 1600 \$4,000 EXOS 101 EXTENSIVE PROCESSOR \$7,500 EXTENSIVE PROCESSOR \$1,500 EXTENSIVE PROCESSOR \$1,500 EXTENSIVE PROCESSOR \$2,500 E	0	B-3 B-3 B-3 B-3 B-3 B-3
Envex Systems, Inc.  Excelen  Gandalf Data, Inc.  Gateway Communications, Inc.  GTE Telenet Communications Corp.  Harris Corp.	ENIVAX 600 \$1,000 to \$3,000 to \$3,00	0	B-3 B-3 B-3 B-3 B-3 B-3
Envex Systems, Inc.  Excelen.  Gandelf Data, Inc.  Gateway Communications, Inc.  GTE Telenet Communications Corp.  Harris Corp.	ENIVAX 600 \$1,000 to \$3,000 to \$3,00	0	B-3 B-3 B-3 B-3 B-3 B-3 B-3

# **Communications Processor Index**

NDOR	MODEL PRICE	P
*	DATANET 8	
M Com-	3704	
m worps	3705-80 M81-M83	
	3705-II E1-L4\$49,270 to \$300,610	
	3725-1	
	3725-2	
ot Corp	25X SERIES \$3,000 to \$25,000	
no Industries Data Systems, Inc	COMMUNICATIONS PROCESSOR 1\$3,000	
ormation Devices Corp	SMART SYNC MODEM	
grated Dealgn Engineering, Inc	PORT-SAVER	
olligent Business Systems, Inc	CSX 1024	
roon Research Corp	INTERCON 100A	
rian, inc.	NI1010 UNIBUS ETHERNET CTLR \$3,000 QUADRITEK SERIES IDC \$895 to \$2,495	
Composition Systems Telecom Products, Inc.		
Bystoms	LINK 91	
ncom Systems, Inc.	CMC-4/8/32. \$14,000 to \$60,000 DNP. \$30,000 to \$300,000	
mooni ayatamaj man	DNP \$30,000 to \$300,000	
-COM DCC, Inc.	CP9000 SERIES II \$20,000 to \$200,000	
morex Corp.	1270 TCU	
om Systems, Inc.	MICRO 800/X.25 CONCENTRATOR PAD \$2,050 to \$4,600	1
rocosym, Inc.	MCS-30	
redata Corp	5750	
	NETWORK SYSTEM \$15,000 to \$20,000	
dema Pluz, Inc.		
	SMRTE ONE \$3,900 CL II/45 \$90,000	********
Alberta las	GL 11/75 \$150,000 RDS 1600 \$1,500	
R Cemten, Inc.	3650	
a Commony most	3670 M85	
	3690	
ikas Data Communications, Inc.	TRANSACTION CONCENTRATOR	
rthern Telecom, Inc.	BMC \$17,000 to \$125,000	
	29X SERIES N/A	
	503	
	565	
	585 \$50,000 to \$200,000 720 COMMUNICATIONS PROCESSOR \$1,700	
Data Corp	720 COMMUNICATIONS PROCESSOR	
adyne Corp		
inhonics Corn.	SYSTEM 8400\$30,000	
	T-COMM	
	000000	
lins Electronics Instruments, Inc.	FLEXPAC PAD	
	DPAC-80/PC \$8,000 to \$15,000	
cessing innovations, Inc.	SAM (SPEECH AIDED MODEM)	
flan Corp.	UT-1 & UT-4 \$39,500 to \$100,000	)
	UT-2 8 UT-3 \$24 000 to \$50 000	)
nyan Corp.	ATTACHED PROCESSOR APS1	)
rtheon Co	RAYNET I. II. III	
S Semiconductors Corp	SAMSON	
ereal Corp	MICRONET 6	)
	MICRONET 8	
	MICRONET 12	
	MICRONET 20 \$4,200	2
	MICRONET 25	
	MICRONET 404 \$8,750 to \$12,100 THE MICRONET SWITCH (STORE/FORWARD MSG) \$65,000 to \$95,000	
twere Results Corp	COMBDARD/HASP \$13,900 to \$26,900	2
the state of the s	COMBOARD/SNA \$18,000 to \$32,800	
erry Corn.	DISTRIBUTED COMMUNICATIONS DECCESSOR/10 \$29,000 to \$50,000	9
	DISTRIBUTED COMMUNICATIONS PROCESSOR/20 \$47,000 to \$100,000 DISTRIBUTED COMM PROCESSOR/40 \$103,000 to \$999,99	0
	DISTRIBUTED COMM PROCESSOR/40 \$103,000 to \$999.99	9
mma Four	MCX & PCX SERIES	1
scom, Inc	STORE & FORWARD MESSAGE SWITCH	0
ndem Computers, Inc	. 6100 COMMUNICATION SUBSYSTEM \$24,000 to \$300,000	0
	INFOSAT \$53,00	0
omes Engineering	MZ-80 \$5,000 to \$12,000	0
N	. 68K30	0
ok Electronics, Inc.	PEOPLE TO COMPUTER INTERFACE	4
nterhalter, inc	DATATALKER	5
-tt	DATATALKER 2	5
prex, mc	XP-UN64	
	XYPLEX SYSTEM	A

ACC IF-11/3780 Processor Function: Front-End Processor Compatibility Classification: 2780/3780 Word Length: 8 bit Host Competibility: DEC PDP-11 Maximum Number Input Lines: 2 Input Transmission Mode: Full-

Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 1,200 bps to

19 200 bos Input Port Code Supported: Ebcdic Protocols Supported: BSC Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Features: Protocol and Code Conversion Price: \$8,000 Distribution Method: End user Number Installed to Date: 100 to

1.000 Date First Installed: March 1981 (See Vendor Profile Page V-1)

IF-11/HDLC Processor Function: Front-End Processor Word Length: 8 bit

Host Compatibility: DEC VAX, DEC PDP-11, DEC LSI-11 Maximum Number Input Lines: 1 Input Transmission Mode: Full-

Input Transmission Speeds Synchronous: 2,400 bos to 500,000 bps Input Port Code Supported: Ascii Protocols Supported: HDLC Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Features: Protocol and Code Conversion, Error Control, User **Programmable** 

Price: \$7.500 to \$10.000 Distribution Method: OEM

IF-11Q/X.25 Processor Function: Front-End Processor Processor Compatibility Classification: X.25 Word Length: 8 bit Host Compatibility: DEC LSI-11 Maximum Number Input Lines: 32 Input Transmission Mode: Full-Duplex

Input Transmission Sp Input Transmission Speeds: Synchronous: 56,000 bps Input Port Code Supported: X.25 Protocols Supported: X.25 Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Features: Protocol and Code Conversion, Error Control, Automatic Disconnect, Multiplexer/Demultiplexer Price: \$9,500 Distribution Method: End user

IF-11/X.25 Processor Function: Front-End Processor Compatibility Classification: X.25 ford Length: 8 bit

Host Competition DEC VAX-11 eliblity: DEC PDP-11, Maximum Number Input Lines: 32 Input Transmission Mode: Full-

Lupiex Input Transmission Speeds: Synchronous: 56,000 bps Input Port Code Supported: X.25 Protocols Supported: X.25 Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Enthers of Section 1997 (1997) Features: Protocol and Code Conversion, Error Control, Automatic Disconnect. Multiplexer/Demultiplexer Price: \$10,000 Distribution Method: End user Number Installed to Date: 50 to 100

IF-11/X.25 PLUS Processor Function: Front-End Processor Compatibility Classification: X.25 PAD

Word Length: 8 bit Host Compatibility: DEC PDP-11, DEC VAX-11 Maximum Number Input Lines: 32 Input Transmission Mode: Full-Duplex Input Transmission Sp

mput rransmission Speeds: Synchronous: 56,000 bps input Port Code Supported: X.25 Protocole Supported: X.25, Asynchronous (Start/Stop) ximum Output Lines: 1 Aggregate Transmission Rate: 1 rea: Protocol and Code Conversion, Error Control, Terminal-Initiated Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), User Programmable Price: \$9,000 to \$24,000 Distribution Method: End user Number installed to Date: 1 to 10

UMC PROCESSOR BOARD Processor Function: Front-End Processor Compatibility Classification: essor Board Word Length: 8 bit Host Compatibility: DEC VAX, DEC Maximum Number Input Lines: 64 Input Transmission Mode: Full-Duplex, Half-Duplex input Transmission Speeds:
Synchronous: 300 bps to 700 bps

Input Port Code Supported: Ebcdic, Ascii, X.25 Protocols Supported: BSC, ADCCP, HDLC, UDLC, X.25, Asynchronous (Start/Stop) (StartStop)
Maximum Output Lines: 1
Aggregate Transmission Rate: 1
Features: User Programmable
Price: \$3,600 to \$12,000 Distribution Method: End user Number installed to Date: 1,000 to **Date First Installed: September** 

ACCESS TELECOMMUNICATIONS ACCESS 34-I

Processor Function: Front-End Processor Compatibility Classification: Non-IBM (Specialty) Word Length: 8 bit Host Compatibility: IBM System/34
Peripherals Supported: CRT,
Printer, Tape Drive, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 8 Input Transmission Mode: Half-

Duplex Input Transmission Speeds: Asynchronous: 55 bps to 19,200

Input Port Code Supported: Ascil Protocols Supported: X.25, Asynchronous (Start/Stop) Maximum Output Lines: 8 Aggregate Transmission Rate: 8 Aggregate Transmission Rate: 192 Features: Protocol and Code

Conversion, Error Control, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller. Local Console (System Control Functions), Automatic Polling, Autodial/Autoanswer Capabiliti Downlined Loading of Remote Node Price: \$6,000 to \$25,000 Monthly Maintenance Fee: \$115 Distribution Method: End user Number installed to Date: 100 to Date First installed: January 1981 (See Vendor Profile Page V-1)

TELECOMMUNICATIONS ACCESS 36-II

Processor Function: Front-End Processor Compatibility Classification: Non-IBM (Specialty) Word Length: 8 bit Host Competibility: IBM System/36 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 8 Input Transmission Mode: Half-Input Transmission Spe Asynchronous: 55 bps to 19,200

Input Port Code Supported: Ascii Protocols Supported: X.25, Asynchronous (Start/Stop) Aggregate Transmission Rate: 8 Aggregate Transmission Rate: 192

DDS Features: Protocol and Code Conversion, Error Control, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, Autodial/Autoanswer Capabilitie **Downlined Loading of Remote Node** Price: \$6,000 to \$25,000 Monthly Maintenance Fee: \$115

Distribution Method: End user Number Installed to Date: 100 to 1,000 Date First Installed: January 1981

ACCESS TELECOMMUNICATIONS ACCESS 38 Processor Function: Front-End Processor Compatibility Classification: Non-IBM (Specialty) Word Length: 8 bit Host Competibility: IBM System/38 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Maximum Number Input Lines: 8 Input Transmission Mode: Half-Input Transmission Speeds:

Asynchronous: 55 bps to 19,200 Input Port Code Supported: Ascii Protocols Supported: X.25, Asynchronous (Start/Stop) Aggregate Transmission Rate: 8 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, Autodial/Autoanswer Capabilit Downline Loading of Remote Node Price: \$6,000 to \$25,000 Monthly Maintenance Fee: \$115 Distribution Method: End user Number Installed to Date: 100 to 1.000 Date First Installed: January 1981

AMDAHL CORP.

Processor Function: Front-End Processor Compatibility Classification: IBM

Word Length: 16 bit Host Competibility: Amdahl 470, Amdahl 580, IBM 370 Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 64,000 bps

Asynchronous: 9,600 bps Input Port Code Supported: Ebcdic, Ascii, X.25, Baudot Protocole Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop)

Maximum Output Lines: 4 Aggregate Transmission Rate: 4 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automati Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities,

Downline Loading of Remote Node Price: \$60,000 Monthly Maintenance Fee: \$320 Distribution Method: End user Number Installed to Date: 100 to 1.000 Date First Installed: September

(See Vendor Profile Page V-2)

AMDAHL CORP. 4705 E

Processor Function: Front-End Processor Compatibility Classification: IBM 37XX Word Length: 16 bit Host Compatibility: Amdahl 470, Amdahl 580, IBM 370 Maximum Number Input Lines: 352 Input Transmission Mode: Full-

Duplex, Half-Duplex Input Transmission Sp Synchronous: 64,000 bps Asynchronous: 9,600 bps Input Port Code Supported: Ebodic, Ascii, X.25, Baudot cols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Ston) Maximum Output Lines: 4 Aggregate Transmission Rate: 4 res: Protocol and Code Conversion From Control Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities. Downline Loading of Remote Node Price: \$120,000 **Monthly Maint** nco Fee: \$320 Distribution Method: End user Number Installed to Date: 100 to 1.000 **Date First Installed: September** 

NUCLEUS 6000-PACKET SWITCH Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Word Length: 16 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Meximum Number Input Lines: 1.024 Input Transmission Moder Full-Duplex Input Transmission Speeds:

Synchronous: 150 bps to 64,000 bps Input Port Code Supported: Ebodic, Ascii, X.25, Baudot Protocols Supported: X.25 Maximum Output Lines: 1,024 Aggregate Transmission Rate:

Aggregate 10,000 bps

Festures: Protocol and Code

Conversion, Error Control, Terminal Emulation Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer. Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoansv Capabilities, Downline Loading of Remote Node Price: \$100,000 Distribution Method: OEM Date First Installed: 1980 (See Vendor Profile Page V-2)

AUSCOM, INC. MODEL 8911A CHANNEL INTERFACE Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator. Distributed Processing Nodes Compatibility Classi Mainframes, PCM Word Length: 16 bit Host Compatibility: IBM Mainframes Peripherals Supported: CRT. Printer, Disk Drive, Diagnostic/Test, Graphics Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds Synchronous: 2,400 bps to 1.000,000 bos Asynchronous: 50 bps to 38,400

Input Port Code Supported: Ebodic, Ascii, X.25, Parallel Binary Data, Baudot

HDLC, BDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 1 Aggregate Transmission Rate: 1

Feetures: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal Controller. Automatic Polling, User Programmabi Price: \$20,000
Distribution Method: End user, OEM
Number Installed to Date: 100 to

Date First Installed: November 1980 (See Vendor Profile Page V-3)

1.000

A. W. COMPUTER SYSTEMS, BRAC A.W. BRIDGE TECH

Processor Function: Message Switch, Distributed Processing Nodes Compatibility Classification: IBM

Series/1 Word Length: 16 bit Host Com atibility: IBM Series/1, DEC PDP-11

Peripherals Supported: CRT, Printer, Disk Drive, Diagnostic/Test Input Transmission Mode: Full-Duplex Input Transmission Spe

Synchronous: 1,200 bps to 9,600 Input Port Code Supported: Ebcdic,

Ascil, X.25, Parallel Binary Data Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop) Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect.

Multiplexer/Dernultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities Downline Loading of Remote Node Distribution Method: End user Number Installed to Date: 10 to 50 Date First Installed: 1973 (See Vendor Profile Page V-3)

BETACOM CORP. PROFESSIONAL COMM MANAGER-2000 Processor Function: Front-End Processor Compatibility Classification: Micro Word Length: 16 bit Host Compatibility: IBM PC-XT. Televideo 910, 802, 800

Peripherals Supported: CRT, Maximum Number Input Lines: 2 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Synchronous: 300 bps to 1,200 bps

Asynchronous: 1,200 bps input Port Code Supported: Ebcdic, Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop), TWX Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Disconnect. Processor-Initiated Dynamic Line Reconfiguration, Automatic Polling, User Programmable, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$1 300 to \$2 500 Monthly Maintenance Fee: \$13 Distribution Method: End user Number installed to Date: 100 to 1.000 (See Vendor Profile Page V-4)

BROADBAND SYSTEMS, INC. PS-1100

Processor Function: Remote-Line Concentrator Compatibility Classification: IBM 3250

Word Length: 32 bit Host Compatibility: IBM 308X, IBM ARYX Peripherals Supported: Graphics

Terminals Maximum Number Input Lines: 1 Input Transmission Mode: Half-Duplex

Input Transmission Sc Synchronous: 2,400 bps to 2,000,000 bps Input Port Code Supported: Ascii Protocols Supported: SDLC Aggregate Transmission Rate: 20,000 bps Features: Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Automatic Polling, User Programmable

Price: \$3,300 Distribution Method: End user Date First Installed: August 1981 (See Vandor Profile Page V-4)

BURROUGHS CORP. BR74

Processor Function: Front-End Processor Competibility Classification: Non-IBM (General Purpose) Host Compatibility: Burroughs B2/3/4000 Maximum Number Input Lines: 32 Input Transmission Mode: Half-Input Transmission Speeds Synchronous: 9,600 bps

Asynchronous: 19,200 bos Input Port Code Supported: Ebcdic, Ascii

Aggregate Transmission Rate: 1 Features: Protocol and Code Conversion, Error Control, Terminal-Initiated Applications Switching. Automatic Disconnect. Terminal Controller, Automatic Polling, Statistics Collection, Autodiai/Autoanswer Capabilities Distribution Method: End user Date First Installed: 1974 (See Vendor Profile Page V-4)

BURROUGHS CORP.

Processor Function: Front-End Processor Competibility Classification: Non-IBM (General Purpose) Host Compatibility: Burroughs B2/3/4000 Peripherals Supported: CRT, Disk Drive Maximum Number Input Lines: 288 Input Transmission Mode: Full-Duplex, Half-Duplex

input Transmission Spe Synchronous: 9,600 bps Asynchronous: 19,200 bps Input Port Code Supported: Ebcdic,

Ascii Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop) Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect. Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilitie Downline Loading of Remote Node Price: \$64,050 to \$124,950
Monthly Maintenance Fee: \$535
Distribution Method: End user
Date First Installed: September

#### BURROUGHS CORP.

CP9582
Processor Function: Front-End
Processor, Message Switch,
Remote-Line Concentrator, Host

Remote-Line Concentrator, Host Independent, Distributed Processing Nodes

Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Host Compatibility: Burroughs Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Card Reader Maximum Number Input Lines: 59 Input Transmission Mode: Full-Duplex, Half-Duplex

Synchronous: 9,600 bps Asynchronous: 19,200 bps Input Port Code Supported: Ebodic, Asoli, X.25 Protocols Supported: BSC, SDLC, BDLC, X.25, Asynchronous

Input Trensmission Sp

(Start/Stop)
Features: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Terminal-Initiated
Applications Switching, Automatic
Disconnect, Processor-Initiated
Dynamic Line Reconfiguration,
Terminal Controller, Local Console
(System Controller, Local Console
(System Control Functions),
Automatic Polling, User
Programmable, On-Line
Maintenance, Statistics Collection,
Autodial/Autoanswer Capabilities,
Downline Loading of Remote Node
Price: \$27,000 to \$44,000
Distribution Method: End user
Date First Installer: Line 1982

# BURROUGHS CORP.

Processor Function: Front-End Processor Processor IBM (General Purpose) Word Length: 48 bit Host Competibility: Burroughs B7900, B8900, B5900 Maximum Number Input Lines: 128 Input Trensmission Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds: Synchronous: 2,000 bps to 56,000 bps Asynchronous: 50 bps to 19,200 bbs

Input Port Code Supported: Ebcdic, Ascil, X.25, Baudot Protocola Supported: BSC, SDLC, HDLC, BDLC, X.25, Asynchronous (Start/Stop)

(Start/Stop)
Aggregate Transmission Rate: 1
Feetures: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automatic Disconnect,
Multiplexer/Demultiplexer,
Processor-initiated Dynamic Line
Reconfiguration, Terminal Controller,
Local Console (System Control
Functions), Automatic Polining, User
Programmable, Statistics Collection,
Automatic Polining, User
Morethy Maintenance Fee: \$300
Distribution Method: End user
Number Installed to Date: 100 to

Date First Installed: January 1980

CENTURY ANALYSIS, INC.

Processor Function: Line Multiplexing Compatibility Classification: NCR Criterion Series Word Length: 18 bit Host Compatibility: NCR Criterion Peripherals Supported: CRT, Printer

Maximum Number Input Lines: 21 Input Transmission Mode: Full-Duplex Input Transmission Speeds:

Asynchronous: 300 bps to 19,200 bps in 19,200 bps in input Port Code Supported: Ascil Protocols Supported: Asynchronous (Start/Stop) Maximum Output Lines: 21 Aggregate Transmission Rate: 96

Feetures: Protocol and Code
Conversion, Error Control, Automatic
Transmission Speed (Baud Rate)
Detection, Terminal-initiated
Applications Switching, Automatic
Disconnect, Terminal Controller, OnLine Maintenance, Statistics
Collection, Autodial/Autoanswer
Capabilities, Downline Loading of
Remote Node

Distribution Method: End user Number installed to Date: 100 to 1,000

Date First Installed: June 1982 (See Vendor Profile Page V-5)

#### CHI CORP. CCP/3205

Processor Function: Front-End Processor, Remote-Line Concentrator, Host Independent Competibility Classification: Sperry 1100 Word Length: 32 bit Host Compatibility: Sperry 1100 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 400 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 1,200 bps to 50,000 bps

Asynchronous: 75 bps to 19,200 bps input Port Code Supported: Ebodic, Asci, X-25, Parallel Binary Data Protocols Supported: BSC, SDLC, ADCCP, HDLC, UDLC, X-25, Asynchronous (Start/Stop), Uniscope Maximum Output Lines: 400 Aggregate Transmiseion Rate: 2,000 bps Essatures: Protocol and Code

2,000 ops Feetures: Protocol and Code Conversion, Error Control, Terminal Enulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$32,000 to \$250,000 Distribution Method: Third-party Number Installed to Date: 100 to 1,000

#### CODEX CORP. CODEX 6520 FEP

Processor Function: Front-End Processor Compatibility Classification: IBM 270X

Word Length: 16 bit Host Competibility: IBM Mainframes Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 240 Input Transmission Modis: Full-Duplex, Half-Duplex Input Transmission Speeds:

Synchronous: 1,200 bps to 230,400 bps Asynchronous: 50 bps to 9,600

input Port Code Supported: Ebcdic, Ascii Baudot Protocols Supported: BSC, Asynchronous (Start/Stop) Maximum Output Lines: 4 Aggregate Transmission Rate: 16,000 bps Features: Protocol and Code Conversion, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, Statistics Collection, Autodial/Autoanswe Capabilities, Multipoint Dynamic Price: \$45,000 Monthly Maintenance Fee: \$450 Distribution Method: End user Date First installed: 1980 (See Vendor Profile Page V-5)

#### COMMEX. LTD.

Processor Function: Front-End Processor Compatibility Classification: IBM

Word Length: 8 bit Host Competibility: IBM Peripherals Supported: CRT, Printer Maximum Number Input Line

Maximum Number input Lines: 4 Input Transmission Mode: Full-Duplex, Half-Duplex, Isochrono Input Transmission Speeds: Synchronous: 1,200 bps to

57,600 bps Asynchronous: 75 bps to 9,600 bps Input Port Code Supported: Ebcdic,

Input Port Code Supported: Ebcdic, Ascii, Baudot, PTTC Protocola Supported: BSC, Asynchronous (Start/Stop), SDA2, TTY2, IBM Series/1 Mariumum Output Lines: 1 Aggregate Transmission Rate: 576

bps Features: Error Control, Automatic Transmission Speed (Baud Rate)
Detection, Automatic Disconnect,
Local Console (System Control
Functions), Automatic Politing, OrLine Maintenance;
Autodial/Autoanswer Capabilities,
Hardware Configurable
Price: \$13,005 to \$190,050
Monthly Maintenance Fee: \$80
Distribution Method: End user
Number installed to Date: 100 to
1,000
Date First Installed: 1976
(See Vendor Profile Page V-6)

#### COMMEX, LTD. CMC-32

Processor Function: Front-End Processor Compatibility Classification: IBM 37XX

Word Length: 8 bit Host Compatibility: IBM Peripherals Supported: CRT, Printer

Printer
Maximum Number Input Lines: 32
Input Transmission Mode: FullDuplex, Half-Duplex, Isochronou
Input Transmission Speeds:
Synchronous: 1,200 bps to

57,800 bps Asynchronous: 75 bps to 9,600 bps Input Port Code Supported: Ebodic, Ascil Rejudot PTTC

Asci, Baudot, PTTC
Protocole Supported: BSC,
Asynchronous (Start/Stop), SDA2,
TTY2, IBM Series/1
Maximum Output Lines: 1

Aggregate Transmission Rate: 576 bps 
Features: Error Control, Automatic 
Transmission Speed (Baud Rate) 
Detection, Automatic Bosonnect, 
Local Console (System Control 
Functions), Automatic Polling, OnLine Maintenance, 
Autodial/Autoarisver Capabilities, 
Hardware Configurable

Hardware Configurable Price: \$35,000 to \$65,000 Monthly Maintenance Fee: \$120 Distribution Method: End user Number Installed to Date: 100 to 1,000

Date First installed: September 1976

#### COMMEX, LTD. DNP-41

DNP-41
Processor Function: Front-End
Processor, Remote-Line
Concentrator, Host Independent
Distributed Processing Nodes
Compatibility Classification: IBM

37XX Word Length: 8 bit Host Compatibility: IBM, DEC Peripherals Supported: CRT, Printer

Printer
Maximum Number Input Lines: 13
Input Transmission Mode: FullDuplex, Half-Duplex, Isochronous
Input Transmission Speedis:
Synchronous: 600 bps to 56,000

bps Input Transmission Speeds: Asynchronous: 75 bps to 19,200 bps

Ascii, Baudot, PTTC Protocols Supported: BSC, ADCCP, X.25, Asynchronous (Start/Ctop), SDA2, TTY2, IBM Series/1 Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Aggregate Transmission Rate: 750

bos Features: Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, **Terminal-Initiated Applications** Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions). Automatic Polling, On-Line Maintenance, Statistics Collection, **Autodial/Autoanswer Capabilities** Downline Loading of Remote Node, User Configurable Price: \$30,000 to \$60,000 Monthly Maintenance Fee: \$140 Distribution Method: End user Number Installed to Date: 50 to 100 Date First Installed: 1982

Processor Function: Front-End Processor, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Compatibility Classification: IBM 37XX

Word Length: 8 bit Host Compatibility: IBM, DEC Peripherals Supported: CRT, Printer

Maximum Number Input Lines: 23 Input Transmission Mode: Full-Duplex, Half-Duplex, Isochronous Input Transmission St Synchronoue: 600 bps to 56,000

Asynchronous: 75 bos to 19,200

hon Input Port Code Supported: Ebcdic, Ascii, Baudot, PTTC Protocola Supported: BSC, ADCCP, X.25, Asynchronous (Start/Stop), SDA2, TTY2, IBM Series/1 Maximum Output Lines: 1 Aggregate Transmission Rate: 750 bos

Features: Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications witching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities. Downline Loading of Remote Node, User Configurable Price: \$50,000 to \$107,000

Monthly Maintenance Fee: \$165 Distribution Method: End user Number installed to Date: 50 to 100 Date First installed: 1982

COMMEX, LTD. DNP-16 Processor Function: Front-End Processor, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Compatibility Classification: IBM 37XX

Word Length: 8 bit Host Competibility: IBM, DEC Peripherals Supported: CRT, Printer

Maximum Number Input Lines: 83 Input Transmission Mode: Full-Duplex, Half-Duplex, Isochronou Input Transmission Spee Synchronous: 600 bps to 56,000

Asynchronous: 75 hos to 19 200

Input Port Code Supported: Ebodic, Ascii, Baudot, PTTC Protocols Supported: BSC, ADCCP, X.25, Asynchronous (Start/Stop), SDA2, TTY2, IBM Series/1 Maximum Output Lines: 4 Aggregate Transmission Rate: 750

ops Seatures: Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection. Autodial/Autoanswer Capabilities Downlined Loading of Remote Node, User Configurable Price: \$75,000 to \$250,000 Monthly Maintenance Fee: \$195 Distribution Method: End user Number installed to Date: 50 to 100 Date First Installed: 1982

COMMTEX, INC. TERMINAL CONCENTRATOR; MDS-8070

Processor Function: Message Switch, Remote-Line Concentrator, Distributed Processing Nodes Compatibility Classification: IBM 3274/6 Compatible rd Longth: 8 bit, 16 bit Host Compatibility: IBM 360/370, IBM 30XX, 43XX, TTY Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 125 Input Transmission Mode: Full-Duplex

Input Transmission Speeds: Synchronous: 19,200 bps Asynchronous: 110 bps to 19,200 bos Input Port Code Supp Protocole Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 4 Aggregate Transmission Rate: 4 Features: Protocol and Code

Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User

Programmable, Statistics Collection, Autodial/Autoanswer Capabilities Downline Loading of Remote Node. Switching Price: \$4,000 to \$20,000 Distribution Method: Third-party Number Installed to Date: 1.000 to 10,000

Date First installed: February 1981 COMPUTER COMMUNICATIONS, INC.

Processor Function: Front-End Processor Compatibility Classification: IBM

Word Length: 16 bit Host Competibility: IBM 370, IBM 30XX, IBM 43XX Peripherals Supported: CRT. Printer, Disk Drive Maximum Number Input Lines: 32 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

nehronous: 2,000 bos to 56,000 bps

Input Transmission Speeds: Asynchronous: 75 bps to 9,600

Input Port Code Supported: Ascil Protocols Supported: BSC, Asynchronous (Start/Stop) Maximum Output Lines: 2 Aggregate Transmission Rate: 8,000 bps

Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, Autodial/Autoanswer

Price: \$28,000 to \$50,000 Distribution Method: End user Date First Installed: 1981 (See Vendor Profile Page V-6)

COMMUNICATIONS, INC. CC-8

Processor Function: Front-End Processor Compatibility Classification: IBM 37XX

Word Length: 16 bit Host Compatibility: IBM 370, IBM 30XX, IBM 43XX Peripherals Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 240 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Synchronous: 2,000 bps to Input Transmission Speeds: Asynchronous: 75 bps to 9,600

Input Port Code Supported: Ascii Protocols Supported: BSC, Asynchronous (Start/Stop), TTY aximum Output Lines: 4 Aggregate Transmission Rate: 16,000 bos

Feetures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate)
Detection, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User
Programmable, Statistics Collection, Autodiai/Autoenswer Capabilities. X.25 Support Price: \$50,000 to \$100,000 Distribution Method: End user Number Installed to Date: 300 Date First ' istalled: 1978

COMPUTER COMMUNICATIONS, INC.

Switch, Electronic Mail Competibility Classification: Custom Design Communications

Word Length: 16 bit Host Competibility: IBM 370, IBM 30XX, IBM 43XX Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 1.000

Input Transmission Mode: Full-Duplex, Half-Duplex input Transmission Speeds: Synchronous: 2,000 bps to

230,400 bps Asynchronous: 75 bps to 9,600 bps Input Port Code Supported: Ebcdic.

Ascii, X.25 Protocols Supported: BSC, HDLC, Asynchronous (Start/Stop), Sabre

Maximum Output Lines: 7 Aggregate Transmission Rate: 12.000 bos Feetures: Protocol and Code

Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller. Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection. Autodial/Autoanswer Capabilities Price: \$200,000 to \$500,000 Distribution Method: End user Number Installed to Date: 50 to 100 Date First Installed: 1976

COMPUTER COMMUNICATIONS, INC. CC-85

Processor Function: Message Switch, Electronic Mail Compatibility Classification: Custom Design Communication Word Length: 16 bit Host Compatibility: IBM 370, IBM 30XX, IBM 43XX

Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: nput Transmission Mode: Full-

Duplex, Half-Duplex

put Transmission Speeds: Synchronous: 2,000 bos to 230,400 bps

Asynchronous: 75 bps to 9,600 Input Port Code Supported: Ebodic.

Protocole Supported: BSC, HDLC, Asynchronous (Start/Stop), Sabre

Maximum Output Lines: 7 Aggregate Transmission Rate: 24,000 bos

Features: Protocol and Code Conversion, Error Control, Terminal **Emulation, Automatic Transmission** Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller. Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities Price: \$200,000 to \$500,000 Distribution Method: End user Number installed to Date: 50 to 100 Date First Installed: 1979

COMPUTER IDENTICS CORP.

LDP-5 Processor Function: Front-End Processor Compatibility Classification: IBM 37XX

Word Length: 8 bit Peripherals Supported: CRT, Printer, Bar Code Scanner Maximum Number Input Lines: 32 Input Transmission Mode: Full-

Input Transmission Speeds: Asynchronous: 110 bps to 9,600

Input Port Code Supported: Ascii Protocols Supported: Asynchronous (Start/Stoo)

Maximum Output Lines: 6
Aggregate Transmission Rate: 96

Features: Protocol and Code Conversion, Terminal Emulation, Multiplexer/Demultiplexer, Local Console (System Control Functions). Automatic Polling, Statistics Collection, Downline Loading of Remote Node Price: \$30,000

Distribution Method: Third-party Number Installed to Date: 50 to 100 Date First Installed: 1979 (See Vendor Profile Page V-7)

#### COMPUTER SYSTEMS **CP/86** Processor Function: Front-End

Processor, Remote-Line Concentrator Compatibility Classification: IBM 270X

Word Length: 16 bit Host Compatibility: IBM PC-XT,4300, DEC PDP-11, DEC VAX-780

Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive,

Diagnostic/Test Maximum Number Input Lines: 32 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Synchronous: 2,400 bps to 9,000

Asynchronoua: 300 bps to 19,200 bps Input Port Code Supported: Ebcdic. Ascii, Parallel Binary Data Protocole Supported: BSC, SDLC, Asynchronous (Start/Stop) Maximum Output Lines: 2 Aggregate Transmission Rate: 1,000 bps Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission

Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Multiplexer/Demultiplexer, Terminal Controller, User Programmable, Autodial/Autoanswe Capabilities Price: \$2,900 to \$10,000

Distribution Method: End user Date First Installed: 1982 (See Vendor Profile Page V-7)

CONTROL DATA CORP. Processor Function: Front-End

Processor Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Compatibility: CDC Cyber 700, CDC Cyber 800 Maximum Number Input Lines: 256 Input Transmission Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds Synchronous: 56,000 bps Asynchronous: 9,600 bps Input Port Code Supported: Ebcdic, Ascii, X.25 Protocols Supported: BSC, SDLC, HDLC, X.25, HASP, CDCCD

Maximum Output Lines: 256 Aggregate Transmission Rate: 256 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions). Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection,

Autodial/Autoanswer Capabilities, Downlined Loading of Remote Node Price: \$36,170 Monthly Maintenance Fee: \$425 Distribution Method: End user Date First Installed: 1974 (See Vendor Profile Page V-8)

CONTROL DATA CORP. 2551-4 Processor Function: Front-End Processor Compatibility Classification: Non-

IBM (General Purpose) Word Length: 16 bit Host Compatibility: CDC Cyber 700, CDC Cyber 800

Maximum Number Input Lines: 256 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 56,000 bps Input Transmission Speeds:

Asynchronous: 9,600 bps Input Port Code Supported: Ebcdic.

Ancii, X.25 HDLC, X.25, HASP, CDCCP Maximum Output Lines: 256 Aggregate Transmission Rate: 256 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection. Automatic Disconnect.

Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities **Downline Loading of Remote Node** Price: \$47.863

Monthly Maintenance Fee: \$475 Distribution Method: End user Date First Installed: 1974

DATAGRAM CORP.

Processor Function: Front-End Processor Compatibility Classific IBM (General Purpose) Word Length: 8 bit Host Competibility: Burroughs Mainframes

Peripherals Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 40 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 110 bos to 9,600

bps Asynchronous: 110 bps to 9,600

Input Port Code Supported: Ebodic, Ascii, Baudot Protocola Supported: Asynchronous

(Start/Stop), Burroughs Pole Select Maximum Output Lines: 2 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Autodial/Autoans Capabilities, Downline Loading of Remote Node

Price: \$6,000 to \$30,000 Distribution Method: End user Number Installed to Date: 100 to Date First Installed: January 1979 (See Vendor Profile Page V-9)

DATAPROBE, INC. DR-10

Processor Function: Distributed

Processing Nodes Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Peripherals Supported: CRT, Printer, Disk Drive, Diagnostic/Test Input Transmission Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds; Synchronous: 50 bps to 19,200 Asynchronous: 50 bps to 19,200

Input Port Code Supported: Ebcdic, Ascii, X.25, Parallel Binary Data Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous

(Start/Stop) Maximum Output Lines: 2 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer. Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling,

Price: \$750 Distribution Method: End user Number installed to Date: 100 to **Date First Installed:** September

1982

(See Vendor Profile Page V-9)

DATASTREAM COMMUNICATION, INC. 774

Processor Function: Remote-Line Concentrator Compatibility Classification: IBM 3270

Host Compatibility: IBM
Peripherals Supported: CRT,
Printer, Diagnostic/Test
Maximum Number Input Lines: 15
Input Transmission Mode: Half-

Input Transmission Speeds: Synchronous: 110 bps to 9,600 bps

Asynchronous: 110 bps to 9,600 Input Port Code Supported: Ebcdic, Ascii, Asynchronous Serial Protocols Supported: BSC Maximum Output Lines: 2 Aggregate Transmission R

ures: Protocol and Code Conversion, Terminal Emulation. Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), Use

Price: \$4,000 to \$10,000 Monthly Maintenance Fee: \$125 Distribution Method: End user Number Installed to Date: 100 to 1.000

**Date First Installed: September** 

#### DATASTREAM COMMUNICATION, INC.

Processor Function: Remote-Line Concentrator Competibility Classification: IBM 3270

Host Compatibility: IBM Peripherale Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 15 Input Transmission Mode: Half-Duplex

Input Transmission Speeds Synchronous: 110 bps to 9,600

bos Asynchronous: 110 bps to 9,600

bps Input Port Code Supported: Ebcdic, Ascii, Asynchronous Serial Protocols Supported: BSC Maximum Output Lines: 2 Aggregate Transmission Rate: 2 Feetures: Protocol and Code Conversion, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), User Programmable Price: \$4,000 to \$6,000 Monthly Maintenance Fee: \$100 Distribution Method: End user Number Installed to Date: 100 to **Date First Installed: September** 

#### DATASTREAM COMMUNICATION, INC.

874

Processor Function: Remote-Line Concentrator Compatibility Classification: IBM 3270 Host Compatibility: IBM Peripherals Supported: CRT, Printer, Diagnostic/Test Meximum Number Input Lines: 15 Input Transmission Mode: Half-

Dunlex Input Transmission Speeds: Synchronous: 110 bps to 9,600 bos

Asynchronous: 110 bps to 9,600 Input Port Code Supported: Ebcdic,

bps Ascii, Asynchronous Serial Protocols Supported: BSC Meximum Output Lines: 2 Aggregate Transmiss Feetures: Protocol and Code Conversion, Terminal Emulation. Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), User Programmable Price: \$16,000 Monthly Maintenance Fee: \$115 Distribution Method: End user Number Installed to Date: 100 to 1.000 **Date First Installed: September** 

#### DATASTREAM COMMUNICATION, INC.

Processor Function: Remote-Line Concentrator Compatibility Classification: IBM 3270 Host Compatibility: IBM Peripherais Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 15 Input Transmission Mode: Half-Duplex

Input Transmission Speeds: Synchronous: 110 bps to 9,600 bos

Asynchronous: 110 bps to 9,600

Input Port Code Supported: Ebodic, Ascii, Asynchronous Serial Maximum Output Lines: 2 Aggregate Transmission Rate: 2 Features: Protocol and Code Conversion, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminalinitiated Applications Switching. Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), User Programmable Price: \$6,000 to \$12,000 Monthly Maintenance Fee: \$150 Distribution Method: End user Number Installed to Date: 1 to 10 Date First Installed: January 1984

#### DAYCOM CORP. DAYCOM

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit, 32 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Input Transmission Mode: Full-Duplex, Half-Duplex Input Port Code Supported: Ebcdic, Ascii Protocols Supported: BSC, SDLC, HDLC, BDLC Features: Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection Number installed to Date: 100 to

SYSTEM 335 Processor Function: Host Independent **Compatibility Classification:** Network Processor Word Length: 8 bit Host Compatibility: DEC, DG, IBM Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 42 Input Transmission Mode: Full-

(See Vendor Profile Page V-10)

Input Transmission Speeds: Synchronous: 2,400 bps to 9,600

Asynchronous: 50 bps to 9.600 Input Port Code Supported: Ebcdic, Ascii, X.25, Baudot Protocols Supported: BSC, X.25. Asynchronous (Start/Stop) Maximum Output Lines: 42 Aggregate Transmission Rate: 4,000 bps Festures: Protocol and Code

Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User

Programmable, On-Line Maintenance Distribution Method: End user, OEM, Third-party
Date First installed: 1984
(See Vendor Profile Page V-10)

#### DCA/TAC SYSTEM 355 Processor Function: Host Independent Compatibility Classification: Network Processor Word Length: 8 bit Host Compatibility: DEC, DG, IBM Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 126 Input Transmission Mode: Full-

Input Transmission Sc Synchronous: 2,400 bps to 9,600

Duplex

Asynchronous: 50 bps to 9,600 bos Input Port Code Supported: Ebcdic, Ascii, X.25, Baudot Protocols Supported: BSC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 126 Aggregate Transmission Rate: 4,000 bps Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate)

Detection, Terminal-Initiated Applications Switching, Automatic Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance Distribution Method: End user, OEM, Third-party Number Installed to Date: 100 to

Date First installed: 1980

DIGITAL EQUIPMENT CORP. ETHERNET COMMUNICATIONS SERVERS Processor Function: Front-End Processor, Remote-Line Concentrator, Host Independent Compatibility Classification: DEC

Communication Service for Ethernet Word Length: 16 bit Host Compatibility: DEC Maximum Number Input Lines: 32 Input Transmission Mode: Full-

Input Transmission Speeds:
Asynchronous: 19,200 bps
Input Port Code Supported: Ascil
Protocols Supported: Asynchronous (Start/Ston) (Start/Stop)
Maximum Output Lines: 32
Aggregate Transmission Rate: 32
Distribution Method: End user, OEM, Third-party Date First installed: March 1984 (See Vendor Profile Page V-10)

#### ENGINEERED SYSTEMS, INC. TCS/500

Processor Function: Front-End Compatibility Classification: IBM 3270

Word Length: 16 bit Host Compatibility: IBM 3270 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Meximum Number Input Lines: 144 Input Transmission Mode: Full-Duplex

input Transmission Si Asynchronous: 600 bps Input Port Code Supported: Ebcdic, Ascii, X.25, Parallel Binary Data, Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 144 Aggregate Transmission Rate: 192

bos Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autorial and Autoansw Capabilities, Downline Loading of Price: \$15,000

Number Installed to Date: 1 to 10 Date First Installed: October 1981 (See Vendor Profile Page V-11)

Processor Function: Front-End Processor, Host Independent Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Peripherals Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 3 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

ENVAX SYSTEMS, INC.

Asynchronous: 2,400 bps

Input Port Code Supported: Ebcdic, Ascil, Baudot cole Supported: Asynchronous (Start/Ston)

Maximum Output Lines: 1 Aggregate Transmission Rate: 96 bps Features: Protocol and Code

Conversion, Automatic Disconnect. On-Line Maintenance, Autodial/Autoenswer Capabilities Price: \$1,000 to \$3,000 Distribution Method: Third-party Number Installed to Date: 1,000 to 10,000 Date First Installed: October 1978 (See Vendor Profile Page V-11)

ENVAX SYSTEMS, INC. TRANSACTION PROCESSOR Processor Function: Front-End

Compatibility Classification: IBM 37XX

Word Length: 8 bit Host Compatibility: IBM 370, 360, DG, Datapoint ARC Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive. Diagnostic/Test

Maximum Number Input Lines: 32 Input Transmission Mode: Full-

Input Transmission Mode: Pull-Duplex, Half-Duplex Input Transmission Speeds: Asynchronous: 9,600 being Input Port Code Supported: Ebodic, Ascii, X.25, Parallel Binary Data, Baudot orted: BSC. SDLC. HDLC, BDLC, X.25, Asynchronous

(Start/Stop) Maximum Output Lines: 4 Aggregate Transmission Rate: 5 '9

bps Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), On-Line Maintenance, Autodial/Autoansv Capabilities, Downline Loading of Remote Node Price: \$4,000 to \$20,000

Distribution Method: Third-party Number Installed to Date: 50 to 100 Date First Installed: February 1981

EXCELAN **EXOS 101** 

Processor Function: Front-End Processor Compatibility Classification: IBM 270X Word Length: 16 bit Maximum Memory Supported:

16.0M bytes Peripherals Supported: Ethernet nput Transmission Mode: Half-

Protocols Supported: Ethernet CCP

Features: Protocol and Code Conversion, Error Control, Terminal Emulation. Multiplexer/Demultiplexer, User

Programmable, Statistics Collection, Downline Loading of Remote Node Price: \$1.700 Distribution Method: OEM Number Installed to Date: 1 to 10 Date First Installed: January 1983 (See Vendor Profile Page V-12)

GANDALF DATA, INC.

PACX IV Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes

patibility Classification: Non-IBM (General Purpose) Word Length: 8 bit, 16 bit Peripherals Supported: CRT, Printer, Diagnostic/Test mum Number Input Lines: 1.024 Input Transmission Mode: Full-

Duplex Input Transmission Sp Synchronous: 2,400 bps to 19.200 bps

Asynchronous: 9,600 bps Input Port Code Supported: Ebodic, Ascii, X.25, Baudot Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop)

Maximum Output Lines: 128 Aggregate Transmission Rate: 190,000 bps Features: Protocol and Code

Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect,

Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Distribution Method: End user Number Installed to Date: 1,000 to

10,000 (See Vendor Profile Page V-12)

QATEWAY COMMUNICATIONS, INC. GATEWAY PROCESSOR

Switch, Remote-Line Concentrator, Host independent Compatibility Classific IBM (General Purpose) Word Length: 8 bit Host Competibility: IBM Peripherals Supported: CRT, Printer, Disk Drive, Diagnostic/Test

Maximum Number Input Lines: 18 Input Transmission Mode: Full-Input Transmission Duplex, Half-Duplex Transmission Speeds: Input Transmission Speeds: Synchronous: 2,400 bps to 56,000 bps

eronous: 110 bps to 19,200 bps Input Port Code Supported: Ebcdic, Ascii, X.25, Parallel Binary Data,

Protocols Supported: BSC, SDLC, ADCCP, HDLC, X.25, Asynchronous

(Start/Stop)
Maximum Output Lines: 18
Aggregate Transmission Rate:

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmis Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabiliti **Downline Loading of Remote Node** Price: \$1,560 to \$4,500 Distribution Method: Third-party Number Installed to Date: 1 to 10 Date First Installed: January 1983 (See Vendor Profile Page V-12)

GTE TELENET COMMUNICATIONS CORP. TP-3005 NETWORK INTERFACE PROCESSOR

Processor Function: Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Competibility Classification: I IBM (General Purpose) Word Length: 8 bit Maximum Number Input Lines: 8 Input Transmission Mode: Half-

Input Transmission Speeds: Asynchronous: 110 bps to 9,600

Input Port Code Supported: Ascii Protocols Supported: X.25, Asynchronous (Start/Stop), X.28,

Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate)
Detection, Terminal-Initiated Applications Switching, Automatic

Multiplexer/Demultiplexer, Local Console (System Control Functions), On-Line Maintenance, Statistics Collection, Autodial/Autoanswe Capabilities, Downline Loading of Remote Node Price: \$2,350

Monthly Maintenance Fee: \$30 Distribution Method: End user Number Installed to Date: 100 to Date First installed: January 1983 (See Vendor Profile Page V-13)

GTE TELENET COMMUNICATIONS CORP. TP3010-II NETWORK INTERFACE

Processor Function: Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Compatibility Classification: Network Interface Process

Word Length: 8 bit Peripherals Supported: Tape Drive Maximum Number Input Lines: 26 Input Transmission Mode: Full-

Duplex, Half-Duplex

Synchronous: 1,200 bps to 9,600 Asynchronous: 50 bps to 9,600

Input Port Code Supported: Ebcdic, Ascil, Baudot Protocols Supported: BSC, SDLC,

X.25, Asynchronous (Start/Stop), 3270 DSP BPAD

Maximum Output Lines: 1 Aggregate Transmission Rai Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$7,500

Monthly Maintenance Fee: \$85 Distribution Method: End user Number Installed to Date: 1,000 to 10.000

Date First Installed: December 1978

HARRIS CORP. **HARRIS 1600** 

Processor Function: Distributed **Processing Nodes** Compatibility Classification: IBM 37XX

Word Length: 16 bit Host Competibility: IBM Mainframes, Sperry 1004, CDC 200 UT

Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Card Reader Maximum Number Input Lines: 4 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmiss ion Sp Synchronous: 1,200 bos to

56,000 bps onous: 110 bps to 9,600

bps Input Port Code Supported: Ebodic, Protocole Supported: BSC, SDLC, HDLC, Asynchronous (Start/Stop)

Maximum Output Lines: 4 Aggregate Transmission Rate: 4 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Terminal Controller, Local Console (System Control Functions). Automatic Polling, User Programmable, Statistics Collection,

Autodial/Autoenswer Capabilities
Distribution Method: End user
Number Installed to Date: 1,000 to 10 000 Date First Installed: September

(See Vendor Profile Page V-14)

HARRIS CORP. HARRIS 8470 Processor Function: Front-End

IBM (General Purpose) Word Length: 48 BIT Host Compatibility: Harris 600, 700, 800, 1000 Peripherals Supported: CRT, Printer, Tape Drive, IEEE 488 Device

Maximum Number Input Lines: 16 Input Transmission Mode: Full-Duplex, Half-Duplex input Transmission Speeds: Synchronous: 1,200 bps to

56,000 bos Asynchronoue: 50 bps to 19,200

bps Input Port Code Supported: Ebodic, Ascii, X.25, Parallel Binary Data Protocols Supported: BSC, X.25, Asynchronous (Start/Stop). tenchmonus

Maximum Output Lines: 1 Aggregate Transmission Rate:

15.000 bps Peatures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Downline Loading of Remote Node Price: \$3,500 Monthly Maintenance Fee: \$20 Distribution Method: End user Date First Installed: September

HARRIS CORP. HARRIS 9240 **Processor Function: Distributed Processing Nodes** stibility Classification: IBM

37YY Word Length: 16 bit Host Compatibility: IBM Mainframes, Sperry 1004, CDC 200

Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Card Reader Maximum Number Input Lines: 4 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission So

nchronous: 1,200 bps to 56,000 bps Asynchronous: 110 bps to 9,600

bps Input Port Code Supported: Ebcdic, Ascii

Protocols Supported: BSC, SDLC, HDLC, Asynchronous (Start/Stop) Maximum Output Lines: 4 Aggregate Transmission Rat Features: Protocol and Code Conversion Error Control Terminal Emulation, Terminal-Initiated Applications Switching, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, Statistics Collection, **Autodial/Autoanswer Capabilities** Distribution Method: End user Number installed to Date: 100 to Date First Installed: March 1982

HEMRIKSEN DATA SYSTEMS 7-80

Processor Function: Front-End Processor, Host Independent, Distributed Processing Nodes
Compatibility Classification: NonIBM (General Purpose) Word Length: 8 bit Host Compatibility: IBM 370, IBM 4300

4300
Peripherals Supported: CRT,
Printer, Diagnostic/Test
Maximum Number Input Lines: 1
Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Sp

Asynchronous: 9,600 bps Input Port Code Supported: Ascii Protocols Supported: Asynchronous (Start/Stop)

aximum Output Lines: 3 Aggregate Tra ion Rate: 96

Features: Protocol and Code Conversion, Terminal Emulation, **Automatic Transmission Speed** (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance Autodial/Autoanswer Capabilities, Downline Loading of Remote Nod Price: \$1,000 Monthly Maintenance Fee: \$20 Distribution Method: Third-party

Number installed to Date: 10,000 to

Date First Installed: April 1980 (See Vendor Profile Page V-14)

HEURIKON CORP. HK-68A

Processor Function: Front-Fod Processor Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 48 Input Transmission Mode: Full-Duplex **Input Transmission Spe** 

Synchronous: 50 bps to 1,000,000 bps

Asynchronous: 50 bps to 38,400 bps Input Port Code Supported: Ascii,

Protocola Supported: BSC, SDI C. ADCCP, HDLC, X.25, Asynchronous

(Start/Stop) Maximum Output Lines: 16 Aggregate Transmission Rate: 16 Features: Protocol and Code Conversion, Error Control, Terminal **Emulation, Automatic Transmission** Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities.

Downline Loading of Remote Node Price: \$3,265

Distribution Method: End user, OEM Number Installed to Date: 100 to 1.000

Date First Installed: October 1983 (See Vendor Profile Page V-14)

HONEYWELL, INC. DATANET 8

Processor Function: Front-End Processor, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Competibility Classification: Network Proces Word Length: 16 bit Host Compatibility: Honeywell DPS 8, DPS 66, DPS 64 Peripherals Supported: Disk Drive Maximum Number Input Lines: 128 Input Transmission Mode: Full-Duplex, Half-Duplex

Input Transmissi on Su Synchronous: 1,200 bps to 56,000 bps

Asynchronous: 75 bps to 19,200 bos Input Port Code Supported: Ebodic, Ascii, X.25 Protocols Supported: BSC, ADCCP,

HDI C Maximum Output Lines: 4
Aggregate Transmission Rate: 4
Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line

Reconfiguration, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection. Downline Loading of Remote Node, Autoanswer Capabilites Price: \$39.065

Monthly Maintenance Fee: \$240 Distribution Method: End user Date First Installed: September (See Vendor Profile Page V-14)

DATANET 6661 Processor Function: Front-End Processor Compatibility Classification:

Network Process Word Length: 16 bit Host Compatibility: Honeywell Series 60 Peripherals Supported: CRT Maximum Number Input Lines: 96 Input Transmission Mode: Full-

Duplex, Half-Duplex **Input Transmission Speeds:** chronous: 1,200 bos to 56.000 bps

Asynchronous: 75 bps to 19,200 Input Port Code Supported: Ebcdic,

Ascii Protocols Supported: BSC, ADCCP, HDLC Maximum Output Lines: 1

stures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate)
Detection, Terminal-Initiated Applications Switching, Automatic Disconnect,

Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities Downline Loading of Remote Node Price: \$36,605

Monthly Maintenance Fee: \$262 Distribution Method: End user Date First Installed: 1980

Processor Function: Front-End Processor atibility Classification: IBM

Host Compatibility: IBM S/370, IBM 4300, IBM 303X, 308X Maximum Number Input Lines: 32 Input Transmission Mode: Ful-Duplex, Half-Duplex Input Transmission Spe

Synchronous: 1,200 bps Asynchronous: 110 bps to 1,200

input Port Code Supported: Ebcdic. Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop) Meximum Output Lines: 2 Aggregate Transmission Rate: 1 Features: Error Control, Terminal-Initiated Applications Switching, Automatic Polling, User Programmable, Autodial/Autoanswer Capabilities Price: \$36.150

Distribution Method: End user Date First Installed: February 1973 (See Vendor Profile Page V-14)

3705-60 M81-M83 Processor Function: Front-End Processor, Remote-Line Concentrator Compatibility Classification: IBM Host Compatibility: IBM S/370, IBM 303X, 308X, IBM 43XX Maximum Number Input Lines: 16 Input Transmission Mode: Full-Duplex, Half-Duplex Input Port Code Supported: Ebcdic, Ascii. X.25 Protocols Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 2 Aggregate Transmission Rate: 2 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate)

Multiplexer/Demultiplexer, Automatic Polling, User Programmable, Statistics Collection, Downline Loading of Remote Node Price: \$39,300 to \$55,940 Distribution Method: End user Date First Installed: June 1981

Detection, Terminal-Initia

Applications Switching,

IMM CORP. 3705-II E1-L4

Processor Function: Front-End Processor, Remote-Line Concentrator Compatibility Classification: IBM 37XX

Host Competibility: IBM 370, IBM 303X, 308X, IBM 43XX Maximum Number Input Lines: 352 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

nchronous: 1,200 bps to 230,400 bps Asynchronous: 455 bps to 9.600

input Port Code Supported: Ebcdic, Ascil, X.25, Baudot Protocote Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop),

Maximum Output Lines: 4
Aggregate Transmission Rate: 4
Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Polling, User Programmable, Downline Loading of Remote Node Price: \$49,270 to \$300,610 Distribution Method: End user Date First Installed: August 1976

IBM CORP.

3725-1 Processor Function: Front-End Processor, Remote-Line Concentrator Compatibility Classification: IBM 37YY Host Compatibility: IBM S/370, IBM 303X, 308X, IBM 43XX Peripherale Supported: CRT Maximum Number Input Lines: 256 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmiss Synchronous: 1,200 bps to 256,000 bps

Asynchronous: 50 bps to 9,600 Input Port Code Supported: Ebcdic, Ascii, X.25 cols Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 8 Aggregate Transmission Rate: 6 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Multiplexer/Demultiple Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, Statistics Collection, Downline Loading of Remote Node

Processor Function: Front-End Processor, Remote-Line Concentrator

Price: \$132,490 to \$299,940

Distribution Method: End user Date First installed: April 1983

patibility Classification: IBM Host Competibility: IBM S/370, IBM 303X, 308X, IBM 43XX Peripherals Supported: CRT Maximum Number Input Lines: 24 Input Transmission Mode: Full-Duplex, Half-Duplex input Transmission Speeds:

input Transmiss nchronous: 1,200 bps to 256,000 bps Asynchronous: 50 bps to 9.600

Input Port Code Supported: Ebodic, Anni Y 25 Protocols Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 2 Aggregate Transmission Rate: 2 res: Protocol and Code

Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, Statistics Collection, Downline Loading of Remote Node Price: \$72,240 to \$85,240 Monthly Maintenance Fee: \$227 Distribution Method: End user,

Third-party Date First Installed: January 1984

ICOT CORP.

Processor Function: Remote-Line Concentrator Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Compatibility: IBM 370X, IBM 3725, NCR 8325 8555 Peripherals Supported: CRT, Printer Maximum Number Input Lines: 32 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Input Transmiss Synchronous: 1,200 bos to 19,200 bps Asynchronous: 300 bps to 9,600

Input Port Code Supported: Ebodic, Ascii, X.25 Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop), Pars, NCR Maximum Output Lines: 25 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Ferminal-Initiated Applications
Switching, Automatic Disconnect,
Multiplexer/Demultiplexer,
Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities, Downline Loading of Remote Node Price: \$3,000 to \$25,000

Number Installed to Date: 100 to

Date First Installed: 1979 (See Vandor Profile Page V-15)

ILENE INDUSTRIES DATA SYSTEMS, INC. COMMUNICATIONS PROCESSOR 1

**Processor Function: Front-End** Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Host Compatibility: Sigma 9000 Peripherals Supported: CRT,

Diagnostic/Test Maximum Number Input Lines: 256 Input Transmission Mode: Full-Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 1,000,000 bps Asynchronous: 19,200 bps

Input Port Code Supported: Ebcdic, Ascii, X.25, Parallel Binary Data, Baudot Protocols Supported: SDLC, Synchronous Maximum Output Lines: 258 Features: Protocol and Code

Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, Autodial/Auto Capabilities, Downline Loading of Remote Node Price: \$3,000

Distribution Method: End user (See Vendor Profile Page V-15)

INFORMATION DEVICES SMART SYNC MODEM

Processor Function: Remote-Line Concentrator Compatibility Classification: IBM

Word Length: 8 bit Host Compatibility: IBM, DEC VAX, Sperry Peripherals Supported: CRT,

Input Transmission Mode: Half-Duplex

Input Transmission Speeds: Asynchronous: 9,600 bps Input Port Code Supported: Ascii Protocole Supported: BSC Features: Automatic Transmission Speed (Baud Rate) Detection, Automatic Polling, User Programmable, Autodial/Autoanswer Capabilities Price: \$6,500

Distribution Method: End user Number Installed to Date: 1 to 10 (See Vendor Profile Page V-15) INTEGRATED DESIGN

ENGINEERING, INC. PORT-SAVER Processor Function: Remote-Line Concentrator Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Host Compatibility: NCR

Peripherals Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 16 Input Transmission Mode: Full-Input Transmission Duplex, Half-Duplex Duplex, Half-Duplex Input Transmission Speeds: Asynchronous: 50 bps to 19,200

ups Input Port Code Supported: Ascii Protocole Supported: IDE Proprietary Maximum Output Lines: 4 Aggregate Transmission Rats: 192

Peatures: Terminal Emulation, Terminal-initiated Applications Switching, Multiplexer/Demultiplexer, Terminal Controller, Automatic Polling, User Programmable, Downline Loading of Remote Node Price: \$1,600 Distribution Nethod: End user Number Installed to Date: 100 to

1 000

Date First installed: 1979 (See Vendor Profile Page V-16)

INTELLIGENT BUSINESS

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator Compatibility Classification IBM (General Purpose) Word Length: 8 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, PC Maximum Number Input Lines:

2.048 Input Transmission Mode: Full-

Input Port Code Supported: Ebodic, Ascil, X.25, Baudot, Telex Protocole Supported: BSC, SDLC, HDLC, X.25, Telex Aggregate Tran

Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic

Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial and Autoenswer Capabilities, Downline Loading of Remote Node

Price: \$00,000
Distribution Method: End user
Number Installed to Date: 1 to 10
Date First Installed: January 1984
(See Vendor Profile Page V-16)

INTERCON RESEARCH CORP. INTERCON 100A

Processor Function: Front-End Processor Competibility Classification: IBM

Word Length: 8 bit Hoet Competibility: DEC VAX, IBM Peripherals Supported: Printer, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 1

Input Transmission Mode: Full-Duplex

synchronous: 58,000 bps Asynchronous: 58,000 bps Asynchronous: 19,200 bps Input Port Code Supported: Ebodic, Accil, BCD Protocole Supported: BSC, SDLC, X.25, Hasp, Scope 200 Blustimum Output Lines: 1 Aggregate Transmission Rate: 1 Aggregate Transmission Rate: 550 bps

Feetures: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Disconnect, Local Console (System Control Functions), Automatic Poling, Downline Loading of Remote Node Priors: \$1,250 to \$4,995 Distribution Methods: OEM Number Installed to Date: 10 to 50 Dates First Installed: 1983 (See Vendor Profile Page V-16)

INTERLAN, INC.
M1010 UNBUS ETHERNET CTLR
Processor Function: Front-End
Processor, Message Switch,
Distributed Processing Nodes
Compatibility: Classification:
Ethernet
Word Length: 18 bit
Nest Competibility: DEC VAX, DEC
PDP-11
Perspherals Supported:
Diagnostic/Test
Ingust Transmission Mode: FullDuclex

Synchronous: Up to 2,500,000 bps Asynchronous: UP to 2,500,000

Asynchronous: UP to 2,500,000 bps linput Port Code Supported: CSMA/CD Blandmum Output Lines: 1 Aggregate Transemiseion Refe: 1 Aggregate Transemiseion Refe: 25,000 bps Peatures: Protocol and Code Conversion, Error Control, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Coracle (System Control Functions), On-Line Maintenance, Statistics Collection, Development, Development, Statistics Collection, Development, Statistics Collection, Development, Statistics Collection, Development, Development, Statistics Collection, Development, Development,

ITEK COMPOSITION SYSTEMS
GUADRITEK SERIES IDC
Processor
Competibility Classification: NonIBM (General Purpose)
Word Length; 8 bit
Peripherals Supported: Printer
Maximum Number Input Lines: 1
Input Transmission Mode: FullDuplex, Half-Duplex
Input Transmission Speeds:
Input Transmission Speeds:

Asynchronous: 50 bps to 9,600

Input Port Code Supported: Ascil Protocole Supported: Asynchronous (Start/Stop) Meximum Output Lines: 1 Aggregate Transmiseion Refe: 1 Feetures: Protocol and Code Conversion, Terminal Controller, User Programmable, Operation Control String Translation Price: \$895 to \$2,495 Distribution Method: End user Number Installed to Date: 100 to 1,000 Date First Installed: 1979 Details.

ITT TELECOM PRODUCTS, INC.

N840
Processor Function: Host Independent Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Dri

Input Port Code Supported: Ascii, X.25, Parallel Binary Data Protocols Supported: BSC, UDLC Aggregate Transmission Rate: Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection Distribution Method: End user Number installed to Date: 100 to 1.000 Date First Installed: 1978 (See Vendor Profile Page V-17)

JC SYSTEMS

Linkt 8
Processor Function: Front-End
Processor, Remote-Line
Concentrator
Competibility Classification: Non-IBM (General Purpose)
Word Length: 8 bit
Host Competibility: 25 Systems
Peripherals Supported: CRT,
Printer, Diagnostic/Test
Maximum Namber input Lines: 4
Input Transmission Blocke: FullDuplox, Half-Duplox
Input Transmission Speede:
Synchronous: 1,200 bps to
110,000 bps

Asymchronous: 50 bps to 111,000 bps Input Port Code Supported: Ebodic, Asci, X:25, Parallel Binary Data Protocote Supported: BS, SDLC, ADCCP, HDLC, BDLC, X:25, X:27, Asynchronous (Start/Stop) Maximum Output Lines: 1 Accordate Transmissions Bates

20,000 bps
Features: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automatic Transmission
Speed (Baud Rate) Detection,
Automatic Disconnect, Processorinitiated Dynamic Line
Reconfiguration, Terminal Controller,
Local Console (System Control
Functions), Automatic Polling, User
Programmable, On-Line
Maintenance, Statistics Collection,
Autodial/Automatics Collection,
Autodial/Automatics Collection,
Monthly Maintenance Fees: 20
Distribution Method: Third-party
Date First Installed: January 1984
(See Vendor Profile Page V-17)

LEMCOM SYSTEMS, INC.

CMC-4/8/32

Processor Function: Front-End
Processor
Compatibility Classification: IBM
270X
Word Length: 8 bit
Host Compatibility: IBM 360, IBM
370, IBM 303X
Peripherale Supported: CRT,
Printer, Diagnostic/Test
Maximum Number Input Lines: 32
Input Transmission Mode: HalfDuplex
Input Port Code Supported: Ebcdic,
Ascil
Protocols Supported: Ebcdic,
Ascil
Protocols Supported: Stop)
Maximum Cutput Lines: 1
Acquracete Transmission Rate:

4,000 bps
Feetures: Error Control, Terminal
Emulation, Automatic Transmission
Speed (Baud Rate) Detection,
Automatic Disconnect, Automatic
Polling, On-Line Maintenance,
Autodial/Autoanswer Capabilities
Price: \$14,000 to \$50,000
Distribution Method: End user
Number Installed to Date: 100 to

(See Vendor Profile Page V-18)

LENCOM SYSTEMS, INC.

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes Compatibility Classification: IBM 37XX Where! Length: 8 bit 18 bit

Word Length: 8 bit, 16 bit Host Compatibility: IBM Peripherals Supported: CRT Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Synchronous: 35,000 bps Input Port Code Supported: Ebcdic, Asci, X.25 Protocole Supported: BSC, SDLC, ADCCP, HDLC, BDLC, UDLC, X.25 Maximum Output Lines: 32 Aggregate Transmission Rets: 240,000 bps Peatures: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission.

Terminal-initiated Applications
Switching, Automatic Disconnect,
Multiplexer/Demultiplexer,
Processor-initiated Dynamic Line
Reconfiguration, Local Console
(System Control Functions),
Automatic Polling, On-Line
Maintenance, Statistics Collection,
Price: \$30,000 to \$300,000
Distribution Method: End user
Humber Installed to Date: 100 to
1,000
Date First Installed: 1981

Date First Installed: 1981

M/A-COM DCC, INC.
CP0000 SERVES II
Processor Function: Distributed
Processing Nodes
Compatibility Classification: Packet
Switching
Word Langth: 16 bit
Peripherals Supported: CRT, Disk
Drive, Diagnostic/Test
Input Transmission Mode: FullDuplex
Input Transmission Speeds:
Synchronous: 64,000 bps

asynchronous: 384,000 bps Asynchronous: 384,000 bps Input Port Code Supported: Ebode, Accil, X.25 Protocole Supported: X.25, X.75 Maximum Output Lines: 2,000 Aggregate Transmission Rate: 2,000 Feetures: Protocol and Code

Peetures: Protocol and Code Conversion, Processor-initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), User Programmable, On-Line Maintenance, Statistica Collection, Autodia/Autoenswer Capabilities, Downline Localing of Remote Node Price: \$20,000 to \$200,000 (See Vendor Profile Page V-18)

IMEMOREX CORP.
1270 TCU
Processor Function: Front-End
Processor
Compatibility Classification: IBM
270X
Word Length: 8 bit
Host Compatibility: IBM 370, IBM
33XX, IBM 38
Peripherale Supported: CPT,
Printer, Diagnostic/Test
Maximum Number Input Lines: 2
Input Transmission Mode: FulDuplox: Half-Duplox
Input Transmission Speede:

Synchronous: 56,000 bps
Asynchronous: 56,000 bps
Input Port Code Supported: Ebodic,
Asci, Baudoi, PTTC, TWX, BCD
Proiscole Supported: SSC,
Asynchronous (Start/Stop)
Maximum Output Lines: 95
Aggregate Transmission Rate: 1,800 bps
Features: Protocol and Code
Conversion, Automatic Transmission
Speed (Baud Rate) Detection,
Terminal-Initiated Applications
Switching, Automatic Disconnect,
Multiplexer/Demultiplexer, Terminal
Controller, Automatic Disconnect,
Multiplexer/Demultiplexer, Terminal

Line Maintenance, Line Maintenance, Autodisi/Autoenswer Capabilitie Distribution Method: End user Date First installed: 1970 (See Vendor Profile Page V-19)

MICRO 800/X.25 CONCENTRATOR PAD

Processor Function: Remote-Line Concentrator, Host Independent Competibility Classification: X,25 PAD

Word Length: 8 bit Host Compatibility: IBM, Prime Primenet, CDC 2501-NOS Peripherals Supported: CRT,

Maximum Number Input Lines: 24 Input Transmission Mode: Half-Duplex, Echoplex

Input Transmission Speeds: Synchronous: 1,200 bps to 9,600 bos Asynchronous: 50 bps to 9,600

Input Port Code Supported: Ebcdic, Baudot

Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Aggregate Transmission Rate: 768 bos

Features: Protocol and Cod Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Statistics Collection, Autodial/Autoansw Capabilities, Downline Loading of Remote Node Price: \$2,050 to \$4,600 Distribution Method: Third-party Number installed to Date: 1,000 to 10,000 Date First Installed: November 1982 (See Vendor Profile Page V-19)

MICROCOSYM, INC. MCS-30

Processor Function: Front-End Processor Compatibility Classification: Honeywell Datanet Word Length: 8 bit Host Compatibility: Honeywell DIA,

Peripherale Supported: Ascii Maximum Number Input Lines: 32 Input Transmission Mode: Half-Duplex

Input Transmission Spe Asynchronous: 1,200 bos to 38,400 bps Input Port Code Supported: Ascii Protocole Supported: Ascii Maximum Output Lines: 32 Aggregate Transmission Rate: 384

Features: Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Multiplexer/Demultiplexer, On-Line Maintenance, Downline Loading of Domote Node Price: \$25,000

Monthly Maintenance Fee: \$200 Distribution Method: End user Number Installed to Date: 10 to 50 Date First Installed: November 1977 (See Vandor Profile Page V-19)

MICRODATA CORP.

Processor Function: Front-End Processor Compatibility Classification: IBM 37XX Word Length: 8 bit Host Compatibility: IBM 2780, IBM Peripherals Supported: CRT,

Printer Maximum Number Input Lines: 1 Input Transmission Mode: Half-Duplex

input Transmission Speeds:
Asynchronous: 19,200 bps
Protocols Supported: BSC
Maximum Output Lines: 1
Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal tion, Automatic Disconnect, Local Console (System Control Functions), On-Line Maintenance, Autodial/Autoanswer Capabilities Price: \$5,100

Distribution Method: End user Number Installed to Date: 100 to 1.000

Date First installed: June 1981 (See Vendor Profile Page V-18)

MICRODATA CORP. NETWORK SYSTEM

Independent Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Compatibility: Microdata, IBM Peripherale Supported: CRT, Printer leximum Number Input Lines:

1.000 Input Transmission Mode: Half-Dunlex

Input Transmission Sp Asynchronous: 9,600 bps input Port Code Supported: Ebodic, Asoli, X.25, Parallel Binary Data, Baudot, Transparent Protocole Supported: BSC, SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 44 Aggregate Transmission Rate: 44 ures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Multiplexer/Demultiplexer, Local Console (System Control Functions), User Programmable, Statistics Collection, Downline Loading of

Price: \$15,000 to \$20,000 MODEMS PLUS, INC. BRITE ONE

Remote Node

Processor Function: Distributed Processing Nodes

Compatibility Classification: Burroughs Burroughs
Word Length: 8 bit
Host Competibility: Burroughs 6900
Peripherals Supported: CRT,
Printer, Diagnostic Test
Maximum Number Input Lines: 1
Input Transmission Mode: FülDuplex, Half-Duplex
Input Transmission Speeds:
Synchronous: 19,200 bps
Input Port Code Supported: Ascillance
(Start/Stop), Synchronous (Start/Stop), Synchronous Pole
Sheet

Maximum Output Lines: 2 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Terminal Controller, Automatic Polling, Autodial/Autoanswer Capabilities Price: \$1,280

Monthly Maintenance Fee: \$10 Distribution Method: Third-party Number Installed to Date: 1,000 to 10 000 Date First Installed: June 1981 (See Vendor Profile Page V-20)

MODEMS PLUS, INC.

SMRTE ONE Processor Function: Distributed Processing Nodes Compatibility Classification: IBM 270X

Word Length: 8 bit Host Competibility: IBM 8100, IBM 4300, IBM 3300 Peripherals Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 2 Input Transmission Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds: Synchronous: 19,200 bps Asynchronous: 192,000 bps Asynchronous: 192,000 bps input Port Code Supported: Ebcdic, Ascii, Parallel Binary Data Protocole Supported: BSC, SDLC, HDLC, Asynchronous (Start/Stop) Maximum Output Lines: 3 Aggregate Transmission Rate: 3 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node

Price: \$3,900
Monthly Maintenance Fee: \$25
Distribution Method: Third-party
Number installed to Date: 10 to 50
Date First Installed: June 1983

CL 11/45 Processor Function: Front-End

MODULAR COMPUTER SYSTEMS, INC. (MODCOMP)

Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Process

IBM (General Purpose) Word Length: 16 bit Hoet Competibility: IBM 360, 370, CDC Cyber, IBM 3033X Peripherale Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, IBM Select Maximum Number Input Lines: 256 Input Transmission Mode: Full-

Input Transmission S nchronous: 1,200 bps to

250,000 bps Asynchronous: 50 bps to 19,200

input Port Code Supported: Ebcdic, Ascil, X.25, Baudot, Maxinet Protocole Supported: BSC, SDLC, ADCCP, HDLC, X.25, Asynchronous

(Start/Stop)
Maximum Output Lines: 256
Aggregate Transmission Rate: Aggregate 14,500 bps

Features: Protocol and Corin Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic connect,

Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities, Downline Loading of Remote Node Price: \$90,000 Monthly Maintenance Fee: \$500 Distribution Method: OEM Number Installed to Date: 100 to

1.000

Date First Installed: 1982 (See Vandor Profile Page V-20)

MODULAR COMPUTER SYSTEMS, INC. (MODCOMP)

CL H/75 Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing

Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Competibility: IBM 360,370, CDC Cyber, IBM 3033X Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, IBM Select Maximum Number Input Lines: 256 Input Transmission Mode: Full-Duplex

Input Transmission Speeds: Synchronous: 1,200 bps to 25,000 bps Asynchronous: 50 bps to 19,200

bos Input Port Code Supported: Ebodic, Ascii, X.25, Baudot, Maxne Protocols Supported: BSC, SDLC, ADCCP, HDLC, X.25, Asynchronous (Start/Stop)

Maximum Output Linea: 256 Aggregate Transmission Rate: 16,000 bps Feetures: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities, Downline Loading of Remote Node Price: \$150,000 Monthly Maint Distribution Method: OEM Number Installed to Date: 100 to 1.000 Date First Installed: 1982

MULTITROMCS, INC. **RDS 1600** 

Proceeeor Function: Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes
Competibility Cleanification: Non-IBM (General Purpose) Host Compatibility: IBM PC-XT, Apple, DEC PDP-11 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Input Transmi Duplex, Half-Duplex Input Transmission Spi Synchronous: 1,200 bps Asynchronous: 4,800 bos Input Port Code Supported: Ascii, Protocole Supported: BSC, SDLC, ADCCP, HDLC, BDLC, UDLC, X.25. Bold, X.27, Asynchronous (Start/Stop), ICP

Maximum Output Lines: 128 Feetures: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities,

Downline Loading of Remote Node Price: \$1.500 Distribution Method: End user Number installed to Date: 100 to 1.000

Date First Installed: 1980 (See Vendor Profile Page V-20)

**MULTITRONICS, INC. SVR 700** 

Processor Function: Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes
Competibility Classification: Non-IBM (General Purpose) Host Compatibility: IBM PC-XT, Apple, DEC PDP-11 Feripherals Supported: CRT.

Printer, Tape Drive, Disk Drive, Diagnostic/Test Input Trensmis Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 1,200 bps Asynchronous: 4,800 bps

nput Port Code Supported: Ascil X 25 rtert BSC SDLC ADCCP, HDLC, BDLC, UDLC, X.25,

Bold, X.27, Asynchronous (Start/Stop), ICP Maximum Output Lines: 10 Features: Protocol and Code Conversion, Error Control, Terminal **Emulation, Terminal-Initiat** Applications Switching, Automatic Disconnect,

Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities, Downline Loading of Remote Node Price: \$1,500 Distribution Method: End user Number Installed to Date: 100 to

Date First Installed: 1980

HCB CONTEN. INC.

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Distributed Processing Nodes Compatibility Classification: IBM 37XX

Word Length: 32 bit Host Compatibility: IBM 360/370, IBM 303X, 43XX, IBM 308X Input Transmission Mode: Full-Duplex, Half-Duplex Input Port Code Supported: Ebcdic. April X 25

Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop) Maximum Output Linea: 2

Aggregate Transmission Rate: 2 Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Distribution Method: End user Number Installed to Date: 1,000 to

Date First Installed: 1975 (See Vendor Profile Page V-21)

MCR COMTEN, INC. 3670 M85

Processor Function: Front-End Processor, Message Switch. Remote-Line Concentrator, Distributed Processing Nodes Competibility Classification: cation: IBM Host Competibility: IBM 360/370, IBM 303X, 43XX, 308X Input Transmission Mode: Full-Duplex, Half-Duplex Input Port Code Supported: Ebodic, Ascii, X.25 Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 4 Aggregate Transmission Rate: 4 res: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic

ford Length: 32 bit

Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Console (System Control Functions), Automatic Polling, User Programmable, Statistics Collection, Autodial/Autonswer Capabilities, Downlined Loading of Remote Node Distribution Method: End user Number Installed to Date: 1,000 to 10,000

Date First Installed: 1972

NCR COMTEN, INC.

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Distributed Processing Nodes Compatibility Classification: Word Length: 64 bit

Host Compatibility: IBM 360/370, IBM 303X 43XX, IBM 308X Input Transmission Mode: Full-Duplex, Half-Duplex Input Port Code Supported: Ebcdic, Ascii, X.25

Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous (Start/Stop)

Maximum Output Lines: 8 Aggregate Transmission Rate: 8 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, Statistics Collection, Autodial/Autoanswer Capabilities, Downlined Loading of Remote Node
Distribution Method: End user
Number Installed to Date: 1,000 to

Date First Installed: 1978

**NOAKES DATA** COMMUNICATIONS, INC. TRANSACTION CONCENTRATOR Processor Function: Front-End Processor Compatibility Classification: IBM

270X Word Length: 8 bit Host Compatibility: Datapoint, TI 990

Peripherals Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 32

put Tren ion Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds: Synchronous: 19,200 bps Asynchronous: 19,200 bps input Port Code Supported: Ebcdic, Ascii

Protocols Supported: SDLC, Asynchronous (Start/Stop) Maximum Output Lines: 32 Aggregate Transmission Rate: 32 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection Price: \$4,500

Distribution Method: End user Number installed to Date: 10 to 50 Date First Installed: 1982 (See Vendor Profile Page V-22)

NORTHERN TELECOM

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Nodes

Competibility Classification: Model

Independent
Word Length: 8 bit
Peripherals Supported: CRT,
Printer, Tape Drive, Disk Drive, Diagnostic/Test, Data Capture Maximum Number Input Lines: 40 Input Transmission Mode: Full-

Input Transmission Spe Synchronous: 110 bps to 19,200 bos

Asynchronous: 110 bps to 9,600 Input Port Code Supported: Ebodic, Ascii, X.25, Parallel Binary Data Protocole Supported: BSC, SDLC, HDLC, X.25, Asynchronous

(Start/Stop)
Maximum Output Lines: 16
Aggregate Transmission Rate: 16
Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect.

Multiplexer/Demultiplexer, Processor-initiated Dynamic Line Reconfiguration, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node, Internal Storage Price: \$17,000 to \$125,000 Distribution Method: End user, OEM Number Installed to Date: 10 to 50 Date First Installed: November 1982 (See Vendor Profile Page V-22)

NORTHERN TELECOM, INC. 29X SERIES Processor Function: Remote-Line Concentrator Compatibility Classification: IBM

270X Word Length: 8 bit Host Compatibility: IBM Peripherals Supported: CRT, Printer, Diagnostic/Test, Asynchronous/Bisynchronous De

Maximum Number Input Lines: 1 Input Transmission Blode: Full-

Input Transmission Speeds: Synchronous: 9,600 bps Input Port Code Supported: Ebodic, is Supported: BSC, SDLC,

IBM SNA aximum Output Lines: 1

Features: Protocol and Code Conversion, Error Control, Terminal **Emulation, Automatic Transmission** Speed (Baud Rate) Detection, Terminal Controller, Local Console (System Control Functions), (aysish Control Particular), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection Distribution Method: End user Number Installed to Date: 1,000 to 10,000

Date First Installed: 1980

MORTHERN TELECOM, INC. 503

or Function: Host Independent, Distributed Processing

Competibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Host Compatibility: IBM Mainframes, CDC Mainframes, Burroughs Mainframes Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Cardpunches Maximum Number Input Lines: 2 Input Transmission Mode: Full-Duplex, Half-Duplex

Input Transmission Speeds Synchronous: 9,600 bos Asynchronous: 9,600 bps input Port Code Supported: Ascil, Parallel Binary Data, Beudot Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop) Maximum Output Lines: 2 Aggregate Transmission Rate: 96

Feetures: Protocol and Code Conversion, Error Control, Terminal Emulation Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automati Polling, User Programmable, On-Line Maintenance, Statistics Collection. Autodial/Autoanswer Capabilities Price: \$10,000 to \$30,000 Distribution Method: End user Number Installed to Date: 1,000 to Date First installed: June 1981

NORTHERN TELECOM, INC.

sor Function: Host Independent, Distributed Processing

Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit word Length: 8 bit Host Competibility: IBM 370i, CDC Mainframes, Burroughs Mainframes Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Printer, Tape Drive, Disk Urrve, Diagnostic/Test, Cardpunches Maximum Number Input Lines: 8 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Input Transmission Speeds Synchronous: 9,600 bps Asynchronous: 9,600 bps Input Port Code Supported: Ascii, Parallel Binary Data, Baudot Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop) Maximum Output Lines: 8
Aggregate Transmission Rate: 96

bps Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial and Autoanswer Price: \$15,000 to \$50,000

Distribution Method: End user Number installed to Date: 100 to 1.000

Date First Installed: April 1983

NORTHERN TELECOM, INC.

sor Function: Host Independent, Distributed Processing Nodes atibility Classification: Non-

IBM (General Purpose) Word Length: 8 bit Host Compatibility: IBM 370, CDC Mainframes, Burroughs Mainframes Peripherata Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Cardpunches Maximum Number Input Lines: 14 Input Transmission Mode: Full-Duplex, Half-Duplex

Duplex, nam-cupex input Transmission Speeds: Synchronous: 9,600 bps Asynchronous: 9,600 bps Input Port Code Supported: Asci, Parallel Binary Data, Baudot Protocols Supported: BSC, SDLC, Asynchronous (Start/Stop) Maximum Output Lines: 14 Aggregate Transmission Rate: 96

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions). Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, **Autodial and Autoanswer** 

Price: \$50,000 to \$200,000 stribution Method: End user te First Installed: June 1980

NU DATA CORP. 720 COMMUNICATIONS PROCESSOR

Processor Function: Front-End Processor, Message Switch, Host Independent
Compatibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Peripherals Supported: CRT Maximum Number Input Lines: 4 Input Transmission Mode: Full-

Input Transmission S Synchronous: 56,000 bps Asynchronous: 50 bps to 19,200 Input Port Code Supported: Asoli, Baudot

Protocols Supported: SDLC
Maximum Output Lines: 4
Aggregate Transmission Rate: 4
Features: Protocol Conversion, Code Conversion, Error Control.

Controller
Price: \$1,700
Distribution Method: Third-party
Data First installed: 1982
(See Vendor Profile Page V-22)

PARADYNE CORP.

Processor Function: Message Switch, Remote-Line Concentrator, Host Independent, Distributed **Processing Nodes** Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Competibility: IBM 360/370, IBM 303X, IBM 308X, 43XX Peripherals Supported: CRT, Printer, Tape Drive, Diagnostic/Test Maximum Number Input Lines: 10 Input Transmission Mode: Full-Duplex Input Transmission Spe

Synchronous: 56,000 bps Asynchronous: 19,200 bps Input Port Code Supported: Ebcdic, Ascii, X.25, Parallel Binary Data Asci, A.25, "arabe briary buta Protocole Supported: SDLC, X.25, Asynchronous (Start/Stop) Maximum Output Lines: 10 Aggregate Transmission Rate: 3,000 bps

Features: Protocol and Code Conversion, Error Control, Terminal tion, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, On-Line Maintenance, stics Collection, Autodial/Autoanswer Capabilities Downline Loading of Remote Node, Self Configuring Price: \$25,000 Distribution Method: End user Number installed to Date: 1,000 to Date First installed: 1978

PARADYNE CORP. SYSTEM 8400

Processor Function: Distributed **Processing Nodes** Compatibility Classific IBM (General Purpose) Word Length: 16 bit Host Compatibility: IBM 370, Paradyne 9200 Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test
Maximum Number Input Lines: 28
Input Transmission Mode: Full-

Input Transmission Speeds: Synchronous: 19,200 bps Asynchronous: 9,600 bps input Port Code Supported: Ebodic,

Protocols Supported: BSC, SDLC, HDLC, Asynchronous (Start/Stop). Paradyne Pixnet Maximum Output Lines: 8 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect.

Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node

Price: \$30,000 Monthly Maintenance Fee: \$185 Distribution Method: End user Number Installed to Date: 1,000 to 10,000

**Date First Installed: 1981** 

PERIPHONICS CORP. T-COMM Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing

Choice and Multip Word Length: 16 bit Peripherale Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Acoustic Coupler Maximum Number Input Lines: 416 Input Transmission Mode: Half-

Imput Transmission Speeds:
Synchronous: 9,600 bps
Asynchronous: 19,200 bps
Input Port Code Supported: Ebcdic,
Ascil, X.25, Baudot
Protocols Supported: BSC, SDLC,
ADCCP, BDLC, X.27, Asynchronous

Maximum Output Lines: 416 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect,

Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller. Local Console (System Control

Functions), Automatic Politing, User Programmable, On-Line Maintenance, Statistics Collection, Autoclaid/Automanews Capabilities, Downline Loading of Remote Node Prises \$50,000 to \$120,000 Distribution Methods: End user Number Installed to Date: 100 to 1,000 Dates First Installatd: 1972 (See Vendor Profile Page V-29)

PERSYST, INC.

DCP18
Processor Function: Frort-End
Processor, Distributed Processing
Nodes
Compatibility Classification: IBM
General Purpose
Word Length: 16 bit
Host Compatibility: IBM
Peripherals Supported: Printer
Maximum Number Input Lines: 4
Input Transmission Mode: Full
Duplox, Hall-Duplex
Input Transmission Mode: Input Transmission Mode: Input Transmission Mode: Input Transmission Mode: Input Transmission Speeds:

Synchronous: 38,400 bps Asynchronous: 38,400 bps Input Port Code Supported: Excdic, Protocols Supported: BSC, SDLC, HDLC, Asynchronous (Start/Stop) Maximum Output Line Feetures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller. Local Console (System Control Functions), Automatic Polling, User Programmable, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$2,000 Distribution Method: End user, OEM, Third-party (See Vendor Profile Page V-23)

PERSYST, INC. PC/3270 Processor Function: Front-End Compatibility Classification: IBM 3270 Word Length: 8 bit Host Competibility: IBM PC, TI Professional Peripherals Supported: Printer, Disk Drive Maximum Number Input Lines: 1 Input Transmission Mode: Half-Duplex Input Port Code Supported: Ebodic Maximum Output Lines: 1 Factures: Error Control. Terminal Emulation, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance Price: \$995 Distribution Method: End user, **OEM**, Third-party

PHILIPS ELECTRONIC INSTRUMENTS, INC. FLEXPAC PAD Processor Function: Front-End Processor, Host Independent Compatibility Cleasification: Non-IBM (General Purpose)
Word Langite B bit
Peripherals Supported: Tape Drive,
Diagnostic/Test
Input Transmission Blods: FullDuplex
Input Part Code Supported: Asoli
Protocols Su

PHOSENEX DIGITAL CORP.
DPAC-80/PC
Processor Function: Front-End
Processor, Message Switch,
Pernote-Line Concentrator, Host
Independent, Distributed Processing
Nodes
Ocmpatibility Classification: IBM
37XX
Word Langett: 8 bit, 16 bit

Word Length: 8 bit, 16 bit
Hoet Competibility: DEC PDP-11/
44, IBM Seried,1, IPF 1000
Peripherels Supported: CRT,
Printer, Tape Drive, Diak Drive,
Diagnostic/Test
Macdimum Number Imput Lines: 16
Input Transentesion Mode: FullDuplex, Helf-Duplex
Input Transentesion Speeds:
Synchronous: 50 bps to
1,000,000 bps
Asynchronous: 50 bps to 19,200
Asynchronous: 50 bps to 19,200

bps imput Port Code Supported: Ebodic, Ascil, X.25, Parallel Binary Data Protocole Supported: BSC, SDLC, ADCCP, HDLC, UDLC, X.25, Asynchronous (Start/Stop), ICP, DDCMP Maximum Output Lines: 16 Aggregate Transmission Rete: 100,000 box

Feetures: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automatic Disconnect,
Multiplexer/Demultiplexer,
Processor-initiated Dynamic Line
Reconfiguration, Terminal Controler,
Local Console (System Control
Functions), Automatic Polling, User
Programmable, On-Line
Meintenance, Autodis/Autonasver
Capabilities, Downline Loading of
Remote Node
Price: \$8,000 to \$15,000
Number installed to Date: 100 to 1000

(See Vendor Profile Page V-23)

PROCESSING INHOVATIONS, ING.
SAM (SPEECH AIDED MODEM)

Processor Function: Front-End Processor Compatibility Classification: IBM Word Length: 8 bit Heat Competibility: HP 3000, DEC VAX, Burroughs Peripherals Supported: CRT, Printer, Dist Drive Maximum Number Hoput Lines: 16 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission speeds: Asynchronous: 1,200 bps Input Port Code Supported: Ebodic, Input Port Code Supported: Ebodic,

Ascii Protocole Supported: BSC, Asynchronous (Start/Stop) Maximum Output Lines: 1 Aggregate Transmission Rate: 192

ops
Features: Protocol and Code
Conversion, Error Control, Terminal
Errulation, Terminal-Initiated
Applications Switching,
Multiplexer/Demultiplexer, Local
Console (System Control Functions),
Automatic Polling, Statistics
Collection, Autodial/Autoanswer
Capabilities
Price: \$1,595 to \$10,000

Distribution Method: End user Number installed to Date: 100 to 1,000 Date First Installed: October 1978 (See Vendor Profile Page V-24)

RADIAN CORP.

Processor Function: Remote Batch Only Competibility Classification: CDC, Sperry, Honeyvell, IBM Word Length: 16 bit Host Competibility: IBM, CDC, Sperry Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test, Pioliter, Digitizer Maximum Number Input Lines: 2 Input Transmission Mode: Full-

Duplex, Half-Duplex Speeds:
Input Transmission Speeds:
Synchronous: 19,200 bps
Protocols Supported: BSC,
Asynchronous (Start/Stop)
Maximum Output Lines: 7
Regregate Transmission Rate: 2
Features: Terminal Emulation
Price: 339,500 to \$100,000
Monthly Maintenance Fee: \$500
Monthly Maintenance Fee: \$500
Distribution Method: End user
Number installed: 1971
Date First Installed: 1971
See Vendor Profile Page V-25)

RADIAN CORP.
UT-2 à UT-3
Processor Function: Remote Batch
Compatibility Classification:
Spery, CDC, IBM
Host Compatibility: IBM, Sperry,
CDC

Peripherals Supported: CRT, Printer, Disk Drive, Diagnostic/Test, Card Punch Maximum Number Input Lines: 1 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds:

Input Transmission Speeds; Synchronous: 9,600 bps Protocols Supported: BSC Maximum Output Lines: 1 Aggregate Transmission Rate: 96 bps Festures: Terminal Emulation Price: \$24,000 to \$50,000 Monthly Maintenance Fee: \$375 Distribution Niethod: End user Number installed to Date: 50 to 100

RANYAN CORP.
ATTACHED PROCESSOR APS1
Processor Function: Front-End
Processor
Compatibility Classification: NonIBM (General Purpose)
Word Length: 16 bit, 32 bit
Host Compatibility: DEC VAX, DEC
PDF-11, DEC LSI-11
Peripherals Supported: CRT,
Printer, Tape Drive, Disk Drive
Maximum Number Input Lines: 64
Input Transmission Mode: FullDuplox, Helf-Duplox
Input Transmission Speeds:
Synchronous: 1,000,000 bp
Input Transmission Speeds:

Asynchronous: 110 bos to 96,000 bps put Port Code Supported: Ascii, Protocols Supported: X.25 Asynchronous (Start/Stop) orted: X.25 Maximum Output Lines: 64 Aggregate Transmission Rate: 6,144 bps Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line intenance, Statistics Collection, Autodial and Autoanswer Capabilities, Downline Loading of Price: \$9,500 to \$28,000

Distribution Method: End user Date First Installed: April 1983 (See Vendor Profile Plage V-25)

RASYTHEORI CO. RANNET I, II, III

Processor Function: Remote-Line Connentrator Compatibility Classification: Non-IBM (General Purpose)
Word Length: 16 bit Hoot Compatibility Classification: Non-IBM (General Purpose)
Word Length: 16 bit Hoot Compatibility: IBM, Amdahl Periphrenia Supported: CRT, Printer, Disk Drive Maustrum Number Input Lines: 126 Input Transmission Model: Full-Duplox, Half-Duplox Input Transmission Speeds: Synchronous: 2.400 bps to 9,600

Synchronous: 2,400 bps to 9,600 bps Input Port Code Supported: Ebcdic, Asci, ALC Protocole Supported: BSC, ALC Maximum Output Lines: 25 Aggregate Transmission Rate: 25 Aggregate Transmission Rate: 1,000 bps Festures: Protocol and Code Conversion, Error Control, Terminal Errulation, Automatic Transmission

Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Downline Loading of Remote Node Price: \$200,000 to \$600,000 Monthly Maintenance Fee: \$2,000 Distribution Method: End user.

Third-party
Number Installed to Date: 50 to 100
(See Vendor Profile Page V-25)

CORP. SAMSON Processor Function: Front-End Processor, Host Independent Compatibility Classification: IBM 37XX

SOS SEMICONDUCTORS

Word Length: 16 bit, 32 bit Host Compatibility: IBM 3780, HP 300 Series, DEC VAX Peripherale Supported: CRT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 34 Input Transmission Mode: Half-Duplex Input Transmission S

Asynchronous: 9,600 bps put Port Code Supported: Ebcdic, Ascii, X.25, Baudot ocols Supported: BSC, SDLC. X.25, X.27, Asynchronous

(Start/Stop) Maximum Output Lines; 1 Aggregate Transmission Rate: 96

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$24,900 Distribution Method: OEM Number Installed to Date: 100 to 1 000 Date First Installed: January 1981 (See Vendor Profile Page V-26)

SIDEREAL CORP. MICRONET 6

Independent, Message Processor Compatibility Classification: Tel TWX, DDD, Private Line Word Length: 16 bit Peripherais Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 6 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Asynchronous: 50 bps to 1,200

nput Port Code Supported: Ascii, Baudot Protocols Supported: Asynchronous (Start/Stop), Telex, TWX, IRC Maximum Output Lines: 6

Aggregate Transmission Rate: 48

Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Local Console (System Control Functions), Programmable, Price: \$18,000 to \$23,000 Monthly Maintenance Fee: \$125 Distribution Method: End user, OEM Number Installed to Date: 1,000 to 10,000 Date First Installed: 1981 (See Vandor Profile Page V-26)

SIDERFAL CORP. MICRONET 8 Processor Function: Messag Switch, Host Independent, Message Processor Compatibility Classification: Telex, TWX, DDD, Private Line Word Length: 16 bit Peripherals Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 8 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds Synchronous: 4,800 bps

Asynchronous: 50 bps to 1,200 Input Port Code Supported: Ebodic, Aacii, Baudot Protocols Supported: BSC, Asynchronous (Start/Stop), Telex, TWY IRC

Maximum Output Lines: 8 Aggregate Transmission Rate: 96 Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Local Console (System Control Functions), User

Programmable, Statistics
Autodial/Autoanswer Capabilities mable, Statistics Collection, Price: \$21,000 to \$26,000 Monthly Maintenance Fee: \$150 Distribution Method: End user, OEM Number installed to Date: 100 to Date First Installed: February 1983

SIDEREAL CORP.

MICRONET 12 Processor Function: Host Independent, Message Processor Compatibility Classification: Tele TWX, DDD, Private Line Word Length: 8 bit Peripherals Supported: CRT, Printer Maximum Number Input Lines: 1 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Asynchronous: 110 bps to 300

Input Port Code Supported: Ascii, Baudot Protocole Supported: Asynchronous (Start/Stop), Telex, TWX, DDD Maximum Output Lines: 1

Features: Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, User Programmable, Autodial/Autoanswer Capabilities Price: \$2,500

enthly Maintenance Fee: \$35 stribution Method: End user, OEM, Third-party Number Installed to Date: 1,000 to 10,000

Date First Installed: February 1984

MICRONET 20 Processor Function: Host Independent, Message Processor Competibility Classification: Telex, TWX, DDD, Private Line Word Length: 8 bit Peripherale Supported: CRT, Printer, OCR interface Maximum Number Input Lines: 4 Input Transmission Mode: Ful-Duplex, Half-Duplex Input Transmission Secrets put Transmission Speeds: Asynchronous: 50 bps to 1,200

Input Port Code Supported: Ascii, Baudot Protocole Supported: Asynchronous (Start/Stop), Telex, TWX, IRC Maximum Output Lines: 4 Aggregate Transmission Rate: 4 Feetures: Protocol and Code

Conversion, Automatic Transmi Speed (Baud Rate) Detection. Automatic Disconnect, User Programmable, Autodial/Autoans Capabilities Price: \$4,200

Monthly Maintenance Fee: \$40 Distribution Method: End user, OEM, Third-party Number Installed to Date: 1,000 to Date First Installed: 1982

SIDEREAL CORP.

Processor Function: Host independent, Message Processor Compatibility Classification: Telex, TWX, DDD, Private Line Word Length: 8 bit Peripherals Supported: CRT, Printer, Disk Drive, ORC Interface Maximum Number Input Lines: 4 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission S

Asynchronous: 50 bps to 1,200 Input Port Code Supported: Ascii, Baudot Protocole Supported: Asynchronous (Start/Stop), Telex, TWX Maximum Output Lines: 4 Aggregate Transmission Rate: 4 Features: Protocol and Code Conversion, Automatic Transmi Speed (Baud Rate) Detection. Automatic Disconnect, User Programmable, Autodial/Autoanswer

Price: \$5,600 nthly Maintenance Fee: \$60 stribution Method: End user, OEM, Third-party

er Installed to Date: 1,000 to Date First Installed: 1982

SIDEREAL CORP. MICRONET 404 Processor Function: Host Independent, Message Procei Compatibility Classification: TWX, DDD, Private Line Word Length: 16 bit Peripherala Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 4 Input Transmission Mode: Full-Duplex, Half-Duplex

nput Transmission Speeds: Asynchronous: 50 bps to 1,200 Input Port Code Supported: Ascii, Beudot Protocole Supported: Asynchronous (Start/Stop), Telex, TWX

Maximum Output Linea: 4 Aggregate Transmission Rate: 4 atures: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Local Console (System Control Functions), User Programmable, Autodial/Autoanswer Capabilities

Price: \$8,750 to \$12,100 Monthly Maintenance Fee: \$100 Distribution Method: End user, OEM Date First Installed: September

SIDEREAL CORP. THE MICRONET SWITCH (STORE/FORWARD MSG) Processor Function: Message Switch, Host Independent Competibility Clessification TWX, DDD, Private Line Word Length: 16 bit Peripherals Supported: CRT, Printer, Disk Drive Maximum Number Input Lines: 24 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Input Transmission Speeds: Synchronous: 2,400 bos to

19,200 bps Asynchronous: 50 bps to 2,400

Input Port Code Supported: Ebcdic, Ascii, X.25, Baudot Protocole Supported: BSC, HDLC, X.25, Asynchronous (Start/Stop), Telex, TWX, IRC Maximum Output Lines: 24 Aggregate Transmission Rate: 560

Features: Protocol and Code Conversion, Error Control, Automatic Transmission Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Local Console (System Control Functions). Automatic Polling, User Programmable, Statistics Collection, Autodial and Autoenswer Canabili Price: \$65,000 to \$95,000

Distribution Method: End user, OEM Humber Installed to Date: 1 to 10 Date First Installed: January 1984

SOFTWARE RESULTS CORP.

COMBOARD/HASP Processor Function: Front-End Processor Compatibility Classification: IBM

S7XX Word Length: 16 bit Host Competibility: IBM, CDC, DEC PDP-11, DEC VAX

PDP-11, DEC VAX Paripherale Supported: Printer Maximum Number Input Lines: 1 Input Transmission Speeds: Synctronous: 2,400 bps to

Synchronous: 2,400 bps to 56,000 bps fo 56,000 bps Input Port Code Supported: Ebodic, Ascii, Parallel Binary Data Pretacoils Supported: BSC Maximum Output Lines: 1 Aggregate Transmission Rate: 1 Festures: Protocol and Code

Convenion, Error Control, Automatic Transmission Speed (Baud Ratio) Detection, Automatic Discorment, Local Console (System Control Functions), Statistics Colection, Autocala/Autoserawer Capabilities Downline Lacaling of Remote Node Price: \$13,300 to \$26,800 Distribution Mischael Concernior 1983 (See Mendor Profile Page V-273)

SOFTWARE RESULTS CORP.

COMBOARD/SNA Processor Function: Front-End Processor Compatibility Classification: IBM

37XX Word Length: 16 bit Host Compatibility: IBM 3780, DEC VAX

Peripherals Supported: Printer Maximum Number Input Lines: 1 Input Transmission Speeds: Synchronous: 9,600 bps to

syntrevorous +9,000 ops to 56,000 ops 8,000 ops Protocole Supported: SDLC Maximum Output Lines: 1 Features: Protocol and Code Conversion. Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Statistics Collection, Autodalf/autoenswer Capabilities, Downline Loading of Remote Node Price: \$18,000 to \$32,800 [Interbution Method: End user

SOFTWARE RESULTS CORP. COMBOARD/3780

Processor Function: Front-End Processor Competibility Classification: IBM 37XX Word Langth: 16 bit Host Compatibility: IBM 3780, CDC 3780, DEC 9DP-11, DEC VAX Puripherals Supported: Printer Maufmann Number Input Lines: 1 Input Transmission Mode: Half-Duglicx

Input Transmission Speeds: Synchronous: 9,600 bps to 56,000 bps Input Port Code Supported: Ebodic, Accii, Parallel Binary Data
Protocole Supported: BSC
Maximum Output Linea:
1 Features: Protocol and Code
Conversion, Error Control, Automatic
Transmission Speed (Baud Rate)
Detection, Automatic Disconnect,
Statistics Collection,
Autodial/Automatic Disconnect,
Statistics Collection,
Autodial/Automatic Prices on Price: \$8,900 to \$21,900
Distribution Method: End user
Number Installed to Date: 10 to 50
Date Pirat Installed: November 1983

BPERRY COREP,
DISTRIBUTED COMM
PROCESSOR/10
Processor Function: Front-End
Processor, Remote-Line
Concentration
Compatibility (Lessification: Sperry
Word Langit: 16 bit
Host Compatibility: Sperry
1100/80/70, Sperry System 11,
Sperry 1100/80/70, Sperry 1100/80/70
Peripherails Supported: CRT,
Printer, Tage Drive, Disk Drive
Maximum Number Imput Lines: 6
Input Transmission Mode: FullDuplex, Half-Duplex
Imput Transmission Speeds:

Synchronous: 2,400 bps to 64,000 bps Asynchronous: 455 bpe to 19,200 bps Input Port Code Supported: Ebodic, Ascil. X.25. Parallel Binary Data.

Uniscope, NTR

Ascii, X.25, Parailei Binary Data, Baudot Proteocle Supported: BSC, SDLC, ADCCP, HDLC, UDLC, X.25, Asynchronous (Start/Stop),

Maximum Output Lines: 1
Aggregate Trensmission Rate: 1
Feetanese Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automato Transmission
Speed (Baud Rate) Detection,
Terminal-nitiated Applications
Switching, Automatic Disconnect,
Processor-initiated Operanic Line
Reconfiguration, Local Console
(System Control Functions),
Automatic Polling, User
Programmable, Ort-Line
Maintenance, Statistics Collection,
Automatic Polling, User
Downline Losding of Remote Node

Autodial/Autoenswer Capabilities, Downline Loading of Remote Node Prica: \$28,000 to \$50,000 Distribution Method: End user Mumber installied to Darle: 10 to 50 (See Vendor Profile Page V-28)

SPERRY CORP.

DISTRIBUTED COMM
PROCESSOR/20
Processor Function: Front-End
Processor, Remote-Line
Concentrator
Compatibility Classification: Sperry
Word Length: 8 bit, 32 bit
host Compatibility: Sperry Series
1100, Sperry System 11, Sperry
Series 90/60
Perhpherale Supported: CRT,
Printer, Tape Drive, Disk Drive
Maximum Number Input Lines: 43
Input Transmission Moder Full-

Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 2,400 bps to

64,000 bps
Asynchronous: 455 bps to
19,200 bps
Input Port Code Supported: Ebcdic,
Ascil, X.25, Parallel Binary Data,
Baudot

Protocols Supported: BSC, SDLC, ADCCP, HDLC, UDLC, X.25, Asynchronous (Start/Stop), Uniscope, NTR

Maximum Output Lines: 2 Aggregate Transmission Rate: 2 Features: Protocol and Code Conversion, Error Control, Terminal **Emulation, Automatic Transmission** Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Processor-Initiated Dynamic Line Reconfiguration, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilitie Downline Loading of Remote Node Price: \$47,000 to \$100,000 Distribution Method: End user Number Installed to Date: 100 to 1.000

EPERRY CORP,
DISTRIBUTED COMM
PROCESSOR/40
Processor Function: Front-End
Processor Function: Front-End
Processor Remote-Line
Concentrator
Competibility Cleselfication: Sperry
Word Langth: 16 bit, 32 bit
host Competibility: Sperry Series
1100, Sperry Series 90/60, Sperry
System 11
Pyripherals Supported: CRT,
Printer, Tape Drive, Disk Drive
Maximum Number Input Lines: 253
Input Transmission Mode: FullDuplox, Half-Duplox
Input Transmission Speeds:
Synchronous: 2,400 bps to

64,000 bps
Asynchronous: 455 bps to 19,200 bps
Input Port Code Supported: Ebodic, Ascil, X.25, Parallel Binary Data, Baudot
Protocole Supported: BSC, SDLC, ADCCP, HDLC, UDLC, X.25, Asynchronous (Start/Stop), Uniscope, NTR

Maximum Output Lines: 8
Aggregate Transmission Rate: 8
Features: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automatic Transmission
Speed (Baud Rate) Detection,
Terminal-Initiated Applications
Switching, Automatic Disconnect,
Processor-Initiated Dynamic Line
Reconfiguration, Local Console
(System Control Functions),
Automatic Polling, User
Programmable, On-Line
Maintenance, Statistics Collection,
Autodial(Autoanswer Capabilities,
Downline Loading of Remote Node
Prince: \$103.000 to \$3999.000 to \$3999

Monthly Maintenance Fee: \$1,200 Distribution Method: End user

SUMMA FOUR MCX & PCX SERIES

MCX & PCX SERIES
Processor Function: Distributed
Processing Nodes
Competibility Classification: Non-IBM (General Purpose)
Word Length: 8 bit
Peripherals Supported: CRT,

Printer
Maximum Number Input Lines: 2
Input Transmission Speeds:
Asynchronous: 300 bps to 9,600

bps input Port Code Supported: Ascil Protocole Supported: Asynchronous (Start/Stop)

(Start/Stop)
Maximum Output Lines: 2
Aggregate Transmission Rate: 2
Features: Error Control, TerminalInitiated Applications Switching,
Automatic Disconnect, Automatic
Polling, User Programmable,
Downline Loading of Remote Node
Detribution Method: Thirty-party
Number Installed to Date: 1,000 to
10,000

(See Vendor Profile Page V-28)

SYSCOM, INC. STORE & FORWARD MESSAGE SWITCH

Processor Function: Message Switch Competibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Peripherals Supported: CPT, Printer, Tape Drive, Disk Drive Maximum Number Input Lines: 32 Input Trensmission Mode: Ful-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 9,600 bps

Synchronouse: 9,600 bps
Asynchronouse: 9,600 bps
Input Port Code Supported: Ascil
Maximum Output Lines: 32
Features: Protocol and Code
Conversion, Error Control, Terminal
Emulation, Automatic Disconnect,
Multiplexer/Demultiplexer, Local
Console (System Control Functions),
Automatic Poling, On-Line
Maintenance, Statistics Collection,
Autodial/Autonawer Capabilities
Price: \$50,000
Instribution Method: End user

Distribution Method: End user Number Installed to Date: 10 to 50 (See Vendor Profile Page V-29)

TANDEM COMPUTERS, INC. 8100 COMMUNICATION SUBSYSTEM Processor Function: Front-End Processor Competibility Classification: Non-IBM (General Purpose) Word Length: 15 bit, 32 bit Peripherals Supported: CRT, Printer, Tape Drive, Disk Drive, Diagnostic/Test Systems Maximum Number Input Lines: 34

Maximum Number Input Lines: 300 Input Transmission Mode: Full-Duplex, Half-Duplex Input Transmission Speeds: Synchronous: 50 bps to 56,000 Asynchronous: 50 bps to 56,000

bos ops input Port Code Supperted: Ebodic, Ascii, X.25, Baudot Protocole Supported: ADCCP, HDLC, Asynchronous (Start/Stop), Exchange 2780

Maximum Output Lines: 300 Aggregate Transmission Rat ion Rate: 16 Features: Protocol and Code Conversion, Error Control, Automatic Disconnect.

Multiplexer/Demultiplexer, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection. Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Price: \$24,000 to \$300,000 onthly Maintenance Fee: \$119 letribution Method: End user Number installed to Date: 10 to 50 Date First Installed: April 1983 (See Vendor Profile Page V-29)

TANDEM COMPUTERS, INC. INFOSAT

sor Function: Earth Station Word Length: 16 bit, 32 bit Maximum Number Input Lines: 8 Input Transmission Mode: Ful-Duplex put Transmission Speeds: Synchronous: 56 bps to 56,000

bps Asynchronous: 56 bps to 56,000

Input Port Code Supported: Expand Maximum Output Lines: 2 Aggregate Transmission Rate: 2 Price: \$53,000 Monthly Maintenance Fee: \$1,100 Distribution Method: End user

#### THOMAS ENGINEERING MZ-80

Processor Function: Front-End Compatibility Classification: IBM 37XX 37XX Word Length: 8 bit Host Competibility: Honeywell Series 60, DPS Series Peripherals Supported: CRT, Printer, Disk Drive, Diagnostic/Test Maximum Number Input Lines: 32 Input Transmission Mode: Half-Duplex

Input Transmiss Asynchronous: 110 bps to 19,200 bps Input Port Code Supported: Ebcdic,

Protocols Supported: BSC, SDLC. Maximum Output Lines: 32 Aggregate Transmission Rate: 3,072 bps

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmis Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Local Console (System Control Functions), Automatic Polling, User Programmable, On-Line

Price: \$5,000 to \$12,000 Distribution Method: End user Number installed to Date: 100 to 1.000

Date First Installed: December 1981 (See Vendor Profile Page V-30)

68K30 Processor Function: Host

Processor Function: Host Independent Compatibility Classification: Non-IBM (General Purpose) Word Length: 6 bit, 16 bit, 32 bit Peripherale Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 2 Input Transmission Mode: Full-Durlex: Half-Durlex Duplex, Half-Duplex

Input Transmission Speeds: Synchronous: 800 bps to 307,200

Asynchronous: 50 bps to 19,200 input Port Code Supported: Ebcdc, Ascii, X.25, Parallel Binary Data Protocols Supported: BSC, SDLC, HDLC, X.25, Asynchronous

(Start/Stop)
Maximum Output Lines: 2
Aggregate Transmission Rate: 6,144 bps

Features: Error Control, Automatic Transmission Speed (Baud Rate) Detection, Processor-Initiated Dynamic Line Reconfiguration, Terminal Controller, User Programmable Price: \$3,750

Distribution Method: End user Number installed to Date: 50 to 100 Date First installed: January 1982 (See Vendor Profile Page V-31)

TUCK ELECTRONICS, INC. PEOPLE TO COMPUTER

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent Competibility Classification: Non-IBM (General Purpose) Word Length: 8 bit Host Competibility: IBM Series/1, Peripherale Supported: CRT, Touch-Tone Phones Maximum Number Input Lines: 64 Input Transmission Mode: Full-

Input Transmission Speeds: Asynchronous: 300 bps to 1,200

Input Port Code Supported: Ascii Protocole Supported: BSC, SDLC, X.25 Maximum Output Lines: 1 Aggregate Transmission Rate: 96

Feetures: Protocol and Code Conversion, Error Control, Multiplexer/Demultiplexer, Automatic Polling, User Programmable, Autodial/Autoanswer Capabilities, Downlined Loading of Remote Node Distribution Method: End user Date First installed: January 1983 (See Vendor Profile Page V-32)

WINTERHALTER, INC. DATATALKER

Processor Function: Front-End Processor atibility Classification: IBM

37.XX Word Length: 8 bit Host Compatibility: "M Peripherale Suppot > d: CRT, Printer, Diagnostic/Test Maximum Number Input Lines: 1 Input Transmission Mode: Half-Dissions." Duplex

nput Transmission S Synchronous: 1,200 bps to 19,200 bps

Input Port Code Supported: Ebodic, Protocols Supported: BSC Maximum Output Lines: 1 Aggregate Transmission Rate: 192

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection, Automatic Disconnect, Terminal Controller, Automatic Polling, User

Programmable
Price: \$995
Distribution Method: End user, OEM, Third-party Number installed to Date: 100 to

1.000 Date First Installed: January 1983 (See Vendor Profile Page V-33)

WINTERHALTER, INC. DATATALKER 2 Processor Function: Front-End

Competibility Classification: IBM 270X

Word Length: 8 bit Host Compatibility: IBM Mainframes Maximum Number Input Lines: 4 Input Transmission Mode: Half-

Input Transmission Speeds: Asynchronous: 9,600 bps Input Port Code Supported: Ebcdic,

Protocois Supported: BSC Maximum Output Lines: 1 Aggregate Transmission Rate: 192 Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Terminal-Initiated

Applications Switching, Automatic Disconnect. Multiplexer/Demultiplexer, Processor-Initiated Dynamic Line Reconfiguration, Automatic Polling, User Programmable, Autodial/Autoanswer Capabilities **Downlined Loading of Remote Node** 

Price: \$895 to \$995 Distribution Method: End user Date First Installed: January 1984

#### XYPLEX, INC. XP-UN64

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Compatibility Classification: Non-

IBM (General Purpose) Word Length: 16 bit Host Compatibility: DEC PDP-11, DEC VAX Peripherals Supported: CRT, Printer Maximum Number Input Lines: 64 Input Transmission Mode: Full-

Input Transmission Speeds: Asynchronous: 9,600 bps Input Port Code Supported: Ebcdic,

Protocols Supported: Asynchronous (Start/Stop)

Maximum Output Lines: 64 Aggregate Transmission Re 999,999 bps

Features: Protocol and Code Conversion, Error Control, Terminal Emulation, Automatic Transmission Speed (Baud Rate) Detection. Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, On-Line Maintenance, Statistics Collection, Autodial/Autoenswer Capabilities Price: \$9,500

Monthly Maintenance Fee: \$100 Distribution Method: End user Date First Installed: September

(See Vendor Profile Page V-33)

XYPLEX SYSTEM

Processor Function: Front-End Processor, Message Switch, Remote-Line Concentrator, Host Independent, Distributed Processing Norles

Compatibility Classification: Non-IBM (General Purpose) Word Length: 16 bit Host Compatibility: DEC VAX, DEC POP-11

erals Supported: CRT, Printer, Diagnostic/Test Maximum Number Input Lines:

Input Transmission Mode: Full-Duplex Input Transmission Sp

Asynchronous: 9,600 bps Input Port Code Supported: Ascii, Parallel Binary Data Protocole Supported: HDLC, Asynchronous (Start/Stop) Maximum Output Lines: 2,000 Aggregate Transmission Rate: 10,000 bps

Features: Protocol and Code Conversion, Error Control, Terminal **Emulation Automatic Transmission** Speed (Baud Rate) Detection, Terminal-Initiated Applications Switching, Automatic Disconnect, Multiplexer/Demultiplexer, Terminal Controller, Automatic Polling, User Programmable, On-Line Maintenance, Statistics Collection, Autodial/Autoanswer Capabilities, Downline Loading of Remote Node Distribution Method: Third-party Number Installed to Date: 50 to 100 Date First Installed: October 1982

# SWITCHING EQUIPMENT

# Index to Switching Equipment By Transmission Type

The index to switching systems has been broken down according to the transmission type — voice, data, nonintegrated voice/data or integrated voice/data — of the different products. Within each section of the index products are grouped alphabetically by vendor and contain the unit price as well as the page number on which the complete product listing can be found.

### **Voice Transmission Devices**

VENDOR	WODEL	PRICE	PAGE
Action/Honeywell	ROADRUNNER DIGITAL EDITION	\$1,000 to \$1,500	. B-40
Amteloo	MCF	N/A	. B-46
Conversational Voice Terminal Corp	CON MODE VOICE TERMINAL	\$4,000 to \$6,000	. B-48
Data Switch Corp.			
Dynatech Data Systems			
GTE Business Communications Systems, Inc	DPD 4600	N/A	. B-51
Information Dynamics Corp			
	IDX 2120		
Iwatsu America, Inc.			
Mitel, Inc.			
		N/A	
Motorola, Inc.	EMX SERIES SWITCHING EXCHANGES	N/A	. B-56
Siemens Communications Systems			
	SD-192MX		
T-Bar, Inc.			
Telecom Technologies			
		\$300 to \$400	8-51
Tie Communications	MERCURY PBX	\$300 to \$400	. B-51
Toshiha America, Inc.		N/A	

# **Data Switching Devices**

VENDOR	MODEL	PRICE	 PAGE
Atlantic Research Corp	DPS-4	\$100 to \$1,000	 B-46
	FBS-1	\$100 to \$1,000	 B-46
	RCS-100	\$100 to \$1,000	 B-46
Backus Data Systems, Inc	TRI CHANNEL SECURITY SYSTEMS	N/A	 B-46
BBN Communications Corp			 B-48
Bytex Corp	AUTOSWITCH 240	\$100 to \$200	 B-48
Codex Corp.			 B-48
	IMS 7800	N/A	 B-48
Commax, Ltd			 B-48
Commtex. Inc.	TERMINAL CONCENTRATOR; MDS-8070	. \$600 to \$820	 B-48
Crosspoint Systems, Inc.	SD 450	N/A	 B-48
Dataproba, Inc.	3274 CONTROLLER BACKUP SWITCH	N/A	 B-48
Date Switch Core.			 8-50
	MODEL 1000	N/A	 8-50
	MODEL 1200	N/A	 8-50
	XY-MAX-2840	N/A	 8-50
DCA/TAC	SYSTEM 3LS NETSWITCH	N/A	 8-50
Develop Electronics, Inc.	9002 DATA SWITCH	N/A	 B-50
	9006 DATA SWITCH	N/A	 8-50
Digitor, inc.		. \$600 to \$700	 8-50
Digital Controls Corp.	DIGITAL CONTROLS 3403	\$985 to \$19,500	 8-50
	DIGITAL CONTROLS 3421	\$985 to \$19,500	 B-50
	DIGITAL CONTROLS 4101		B-50
Digital Laboratories, Inc.	3R	\$395	 B-50
	MICRO MATRIX	\$245	 8-50
	MICRO MATRIX II		8-50
	TLC	\$245	 B-50
	WAP	\$395	 B-51
Duracom Corp.	SELECT 8	\$400 to \$6,000	 B-51
Dynatoch Data Systems			B-51

# **Switching Equipment Index**

/ENDOR	MODEL	PRICE		PAGE
Dynatoch Data Systems	CTM 1000	\$400 to \$6,000		8-51
	DYNASWITCH	\$400 to \$6,000		8-51
	DYNASWITCH MARK II		********	B-51
	VS CHANNEL ACCESS SWITCH	\$4,000		B-51
Dynatach Packet Tachnology, Inc.	MULTI SWITCH X.2	\$4000		8-5
Dectrodata, Inc.	CLS 2	\$125		B-5
Electronic Interface Associates	\$8	\$1,800 to \$1,800		B-5
	S 24	\$100 to \$259		8-5
Ericson Progmetic, Inc	ERIPAX	\$1,600 to \$1,800		8-51
Randalf Data, Inc.	PACX TM	\$135 to \$500		B-5
decaraphix, inc.	IPX 5410	N/A		8-5
infotron Systems Corn.	IS 4000/4002 INTELLIGENT SWITCHING SYSTEM	. \$140 to \$240		8-5
Intelligent Business Systems, Inc.	CSX 1024			8-5
ITT Telecom Products, Inc.	DPS 1500			8-5
M/A-Com. Inc.	IDX 3000			8-5
Micom Systems, inc.				8-5
Natural Products, Inc.	BABYNET	\$1,450		8-5
				8-5
Paradyne Corp		\$000 to \$2,000		B-5
		\$500 to \$1,100	********	8-5
Syscom, Inc		\$900 to \$1,100		8-5
T-Ber, Inc.				8-5
	VIRTUAL SWITCH MATRIX			8-5
Tellabe, Inc.				8-5
Terminal Data Corp				8-5
Western Datacom	UNISWITCH 1020			
Western Telematic, Inc				. 3-6
	CAS 41	\$395		. 8-6
	CAS 164	\$795		. B-6
	PSU 41	\$395		. B-6
	TM 41			. B-8
Xvolax, inc.	XYPLEX SYSTEM	N/A		. B-6

# Nonintegrated Voice/Data Switching Devices

VENDOR	MODEL	PRICE	PAGE
American Telecom, Inc.	FOCUS ELITE		
AT&T Information Systems, Inc	DIMENSION	N/A	B-40
Codex Corp.	IMS 7760		B-41
Computer Systems	TS/88	\$320 to \$500	B-40
Data Switch Corn.	ANA-MAX	N/A	B-50
Daycom Corp	DAYCOM	NA	B-50
QTE Business Communications Systems, Inc		NA	B-5
Harris Core.		\$320 to \$500	B-5
	400-M (400M-2 AC OR DC)		B-5
	1201 (1201-3 AC OR DC)		B-5
	1202 (1202-6 AC OR DC)		B-5
		\$400 to \$550	8-5
	1205/1205-3 DC	\$450 to \$600	B-5
		N/A	B-5
Hitachi America, Ltd.			B-5
IPC Technology, Ltd.	DPX III. 100.160.1000		B-5
ITT Business Communications Corp.			8-5
hratsu America, Inc.			8-5
Naico Labs, Inc.			B-5
merco Leide, Inc	MAX-212	400	8-5
	MAX-424	\$120	B-5
	MAX-824		B-5
			B-5
Morgan Data Systems			8-5
Solid State Systems, Inc.			B-5
T-Bar, Inc.			B-5
		\$85 to \$150	B-5
Teknekron Info Switch			
Tele/Resources	. TR 150 SERIES	\$300	B-5

# Integrated Voice/Data Switching Devices

VENDOR	MODEL	PRICE	PAGE
Amteipo	EVE	N/A	. B-48
	LEPRECHAUN	N/A	. D-48
	MINI MESSAGE CENTER		
Anderson Jacobson, Inc	10X-1000 INTEGRATED OFFICE EXCHANGE \$500	to \$800	. B-48

# **Switching Equipment Index**

VENDOR	MODEL	PRICE	PAGE
AT&T Information Systems, Inc.	SYSTEM 85	\$870 to \$1,059	 B-46
CXC Corp.	ROSE	N/A	 B-48
Integers, Inc.	IBX TM		B-54
Interconnect Planning Corp.	DPX 1000		8-54
manage of the same	DPX 100		B-54
	DPX 160		B-54
ITT Talecom Products, Inc.	1210 SYSTEM		8-54
II I Talecom Products; Inc			B-54
		\$200 10 \$300	
Iwatsu America, Inc	OMEGA IV IDS-128		B-54
	OMEGA IV ES-824/1648		
Mittel, Inc.			8-55
	SX-10		
	SX-20		8-56
Motorela, Inc.	EMX SERIES RADIO TELEPHONE	N/A	 8-54
Harthern Talacom, Inc.	DMS 10		
The same of the sa	DMS 100		
	DMS 200		
	SL 1		
	SL 100		
	CSV 24B		
OKI Electronics of America, Inc	SPECTRUM 4000		
	SPECTRUM 100		
	SPECTRUM 700		
Periphonics Corp	T-COMM	N/A	 B-57
Prolink Corp.	PROLINK	\$500 to \$800	 B-57
Reckwell International Corp		N/A	8-57
Rolm Corp.			
**************************************	CBX II 8000 CPU		
	CBX II 9000 CPU		
Siemans Communications Systems	SATURN II		
siemens Communications systems			
	SATURN III		
	MC 56 56T		
United Technologies/Lexar Corp			
	UTX 1001		
	UTX 1200		
Ztal, Inc	PNX	. \$800 to \$1000	 8-60

ACTION/HONEYWELL ROADRUNNER DIGITAL EDITION Equipment Type: Tandem Transmission: Voice, Data. Integrated Voice/Data, Video Switch Technology: Digital Switching Matrix: Time/Space/Time Medulation Method: PCM Maximum Trunks Supported: 4,096 Attendent Consoles (Maximum): 7 Matrix Architecture: Nonblocking, 100%

Meximum Transmission St Voice: 64.000 bit/sec Data: 1,544,000 bit/sec Advanced Feetures: T-1 Carrier Interface, X.25 Interface, Security, Diagnostics, Data Security, Common Channel Switch

Purchase: \$1,000 to \$1,500 Distribution Method: End user Number Installed to Date: 10 to 25 Date First Installed: September (See Vendor Profile Page V-1)

AMERICAN TELECOM, INC. **FOCUS ELITE** 

Equipment Type: PBX Transmission: Nonintegrated Voice/ Data Switch Technology: Digital vitching Matrix: Time Division Modulation Method: DM Maximum Trunks Supported: 56 Maximum Stations Supported: 288 Attendent Consoles (Maximum): 4 Matrix Architecture: Nonblocking Maximum Simult Trenemie iona: 128

Advanced Features: User Programmable, Security, Diagnostics, Data Security Distribution Method: Third-party Number Installed to Date: More than 100 **Date First Installed: September** 1976

(See Vendor Profile Page V-2)

### AMPTEL CO.

EVE Equipment Type: PBX Transmission: Integrated Voice/ Data Switch Technology: Digital Switching Matrix: PCM Modulation Method: PCM Maximum Trunks Supported: 24 Maximum Stations Supported: 2.000 Attendent Consoles (Maximum): 12 Matrix Architecture: Nonblocking, 100% Transmissions: 12 Minorimum Trans mission Speeds:

Voice: 64,000 bit/sec Advanced Features: T-1 Carrier Interface, OA, Security, Data Security Advanced Attendant Features: Paperless Phone Distribution Method: End user Number Installed to Date: 1 to 10 Date First Installed: May 1983 (See Vendor Profile Page V-2) AMTELOO LEPRECHAUN **Equipment Type: PBX** Transmission: Integrated Voice/ Data

Switch Technology: Analog Switching Matrix: Relay Maximum Trunks Supported: 1 Maximum Stations Supported: 14 Attendant Consoles (Maximum): 1 100%

Maximum Simultaneous Transmissions: 1 Advanced Features: OA, Diagnostics Distribution Method: End user Humber Installed to Date: 25 to 50 Date First Installed: September

AMTELCO LITTLE GUY Equipment Type: PBX Switch Technology: Analog Switching Matrix: Relay Maximum Trunks Supported: 4 Attendant Consoles (Maximum): 1 Matrix Architecture: Nonblocking, Transmissions: 1 Advanced Festures: OA. Diagnostics Distribution Method: End user Number Installed to Date: 25 to 50 Date First Installed: September

AMTELCO MCE

MCF
Equipment Type: PBX
Transmiselors: Voice
Switch Technology: Analog
Switching Matrix: Rolay
Maximum Trunks Supported: 90
Maximum Sations Supported: 90
Attendent Consoles (Maximum): 12
Matrix Architecture: Blocking
Maximum Stations Supported: 90
Maximum Stations Supported: 90 Maximum Simultaneous Transmissions: 36 Advanced Features: OA, Diagnostics **Advanced Attendant Feature** Electronic Mail, Corporate Message Center, Information Retrieval Distribution Method: End user Number installed to Date: 10 to 25 Date First Installed: March 1982

MINI MESSAGE CENTER Equipment Type: PBX lesion: Integrated Voice/ Data Switch Technology: Analog Switching Matrix: Relay Maximum Trunks Supported: 1 Maximum Stations Supported: 14 Attendant Consoles (Maximum): Matrix Architecture: Nonbiocking. 100%

Transmissions: 1 Advanced Features: OA. Diagnostics ribution Method: End user **Date First Installed: March 1984** 

Maximum Simultaneous

ANDERSON JACOBSON, INC. 10X-1000 (INTEGRATED OFFICE EXCHANGE) Equipment Type: PABX
Transmission: Integrated Voice/

Switch Technology: Digital Modulation Method: PCM Maximum Trunks Supported: 1,536 Maximum Stations Supported: 16,000

Matrix Architecture: Nonblocking, 100%

Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Minl/Mainframe), Voice Store and Forward, OA, Security, Diagnostics, Data Security, Energy Control/Management, RJE to Host Interface, Protocol Conversion

Lease: \$40 to \$60

Purchase: \$500 to \$800 Average Monthly Maintenance: \$ Distribution Method: OEM. Third-(See Vendor Profile Page V-2)

ATLANTIC RESEARCH CORP.

DPS-4 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Matrix Architecture: Nonblocking Maximum Transmission Speeds: Data: 2.000.000 bit/sec

Purchase: \$100 to \$1,000 Distribution Method: End user Number installed to Date: 10 to 25 Date First Installed: January 1978 (See Vendor Profile Page V-3)

ATLANTIC RESEARCH CORP. FBS 1

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Matrix Architecture: Nonblocking Maximum Transmission Speeds: Data: 2.000.000 bit/sec

Purchase: \$100 to \$1,000
Distribution Method: End user
Number Installed to Date: 10 to 25
Date First Installed: January 1978

ATLANTIC RESEARCH CORP.

RCS-100 Transmission: Data Switch Transmission: Data Switch Technology: Digital Matrix Architecture: Nonblocking Maximum Transmission Speeds: Data: 2,000,000 bit/sec

Purchase: \$100 to \$1,000 Distribution Method: End user Number installed to Date: 10 to 25

AT&T INFORMATION SYSTEMS, INC. **Equipment Type: ICBX** namission: Nonintegrated Voice/ Switch Technology: Analog Switching Matrix: Time Division Modulation Method: PAM Maximum Trunks Supported: 1,100 Maximum Stations Supported:

Attendant Consoles (Maximum): 480

Matrix Architecture: Blocking Maximum Transmission Spec Data: 9,600 bit/sec Advanced Features: User Programmable, T-1 Carrier Interface, X.25 Interface, Voice Store and Forward, OA, Security, Diagnostics, Data Security, Energy Control/Management, RJE to Host

Advanced Attendant Features: Electronic Mail, Text Message, Uniform Wiring
Distribution Method: End user
Number Installed to Date: More than 100

Date First Installed: March 1975 (See Vendor Profile Page V-3)

AT&T INFORMATION SYSTEMS, INC. Equipment Type: ICBX Transmission: Integrated Voice/

Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 2,250 Maximum Stations Supported:

Attendant Consoles (Maximum): 480 Matrix Architecture: Nonblocking.

Voice: 64,000 bit/sec Data: 64 000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), OA, Security, Diagnostics, Data Security, Energy Control/Management, RJE to Host Interface Advanced Atte Electronic Mail, Text Message

Uniform, Wiring Purchase: \$870 to \$1.059 Distribution Method: End user Number Installed to Date: More

Date First Installed: April 1983 BACKUS DATA SYSTEMS,

TRI CHANNEL SECURITY SYSTEMS Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Time Division Maximum Simultaneous Transmissions: 3 Maximum Transm

Data: 9,600 bit/sec Advanced Features: LAN Capability (Micro/Mini), Security, Data Security FIRST WE MADE IT SMART.



Building a packet switching network used to be a frightening undertaking. But not any more. Philips' Flex Pac equipment has all the smarts your X.25 network will ever need, and it's about as difficult to instal as a home stereo.

It's ideal for private networks, It's a perfect interface between your business and public X.25 carriers, It's great for hybrid networks where your internal X.25 communications are backed up by public networks. And it's just the ticket for international applications since we already interface with just about every public X.25 network in the world

Most important, Flex Pac gives you the best in centralized network management. Remote diagnostics down to the asynchronous port level. Downline program and configuration loading from your own Flex Pac. Network Management Center or our Network Diagnostics.

nostic Center in Mahwaii, New Jossey, Full restrict statistics. Complete call accounting. Even a remote datascope" capability. The kinds of features worthought you couldn't get an environg but very expensive hardware. Yet all FlexPac X.25 Switches, PADs and the Network Management Cortex are configured in a compact. 19 inch unit espable of throughput exceeding that of inteh larger systems.

Now you can have the efficiency and post savings of packet switching without the trainia. From Philips, a world leader in communications technology.

Philips Electronic Instruments, Inc. 85 McLee Drive Mahwah, New Jersey 07430 Telephone (2011) 529, 9870



PHILIPS

Number installed to Date: 50 to 100 (See Vendor Profile Page V-3)

### BBH COMMUNICATIONS

C 30 PBH (PACKET SWITCH NODE)
Equipment Type: Packet Processor
Transmisselon: Data
Switch Technology: Upital
Switch Technology: Upital
Switching Misrits: Statistical
Maximum Trunks Supported: 14
Aktondent Consolee (Meximum): 1
Maximum Dimultamious
Transmissions: 500

Interest of the Control of the Contr

### Additional information provided for by vendor

BBNCC markets private packe1-switching networks. The company's tilly integrated line of products and services provides a total soutino approach to managing network growth and controlling data communications cost. BBNCC designs, installs and maintains wide area X.25 networks for clients located worldwide.

### BYTEX CORP.

AUTOSWITCH 240
Equipment Typer. Matrix Switch
Transentiselon: Data
Switch Technology: Digital
Switch Technology: Digital
Switching Matrix: Time Division
Blodulation Method: PAM
Maximum Trunks Supported: 240
Attendent Consoles (Maximum): 16
Matrix Architecture: Blocking
Maximum Simulataneous
Transentiselons: 120
Maximum Timulataneous
Transentiselons: 120
Maximum Timulataneous
Results Switch
Maximum Timulataneous
Transentiselons: 200
Maximum Timulataneous

Data: 306,000 bit/sec Advanced Features: User Programmable, LAN Capability (Micro/Min/Mainframe), OA, Security, Diagnostics, User Expandable Price:

Purchase: \$100 to \$200 Distribution Method: Third-party Number Installed to Date: More than 100 Date First Installed: September 1981 (Sae Vendor Profile Page V-4)

# CODEX CORP.

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switch Technology: Digital Switching Metrix: Time Division Modulation Metrixos: PCM Maximum Stations Supported: 512 Atlandant Consoles (Maximum): 1 Transmissions: 256 Maximum Transmission Speeds:

Transmission species.

Data: 19,20u nit/sec
Advanced Features: Diagnostics,
Data Security
Distribution Method: End user
Number Installed to Date: More
than 100
Date First Installed: 1880
CSee Vendor Profile Page V-5)

### CODEX CORP.

IMS 7780
Equipment Type: Data Switch
Transmission: Nonintegrated Voice/
Data
Switch Technology: Digital
Switching Metrix: Space Division
Modulation Method: PCM
Maximum Stations Supported:
1,440
Attendant Consoles (Maximum): 6

Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 720 Maximum Transmission Speeds:

Data: 64,000 bit/sec
Advanced Features: User
Programmable, Security, Diagnostics
Distribution Method: End user
Rumber installed to Date: 50 to 100
Date First Installed: 1983

# CODEX CORP.

Equipment Type: PABX
Transmission: Data
Tevensission: Data
Switching Matrix: Time Division
Modulation Method: PCM
Maximum Stations Supported: 508
Attendent Consoles (Maximum): 1
Metrix Architecture: Norbiocking
Maximum Simultaneous
Transmissions: 254
Maximum Transmission Speeds:

Data: 19,200 bit/sec Advanced Features: Security, Diagnostics Distribution Method: End user Number Installed to Data: More than 100 Date First Installed: September 1990

### COMMEX, LTD. DNP-4R, -6R, -16E

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Statistical Maximum Transmission Speeds: Data: 56,000 bit/sec

Advanced Features: RJE to Host Interface Average Monthly Maintenance:

Distribution Method: End user Number installed to Date: 25 to 50 Date First installed: 1982 (See Vendor Profile Page V-6)

### COMMTEX, INC. TERMINAL CONCENTRATOR; MDS-8070 Equipment Type: Data Switch

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: External Maximum Trunks Supported: 20 Maximum Stationa Supported: 125 Maximum Simultaneous Transmissions: 125

Data: 19,200 bit/sec
Advanced Features: User
Programmable, T-1 Carrier Interface,
X.25 Interface, LAN Capability
(Micro/Mini), OA, Security,
Diagnostics, RJE to Host Interface,
Protocol Conversion

Purchase: \$600 to \$820
Distribution Method: Third-party
Number Installed to Date: More
than 100
Date First Installed: February 1981

### COMPUTER SYSTEMS

TS/88 Equipment Type: PABX Transmission: Nonintegrated Voice/ Data Switch-Panology: Digital Switch-Ing Metrix: Space Divsion Modulation Method: DM Maximum Tranks Supported: 50 Maximum Stations Supported: 400 Attendant Conceles (Maximum):

100 Matrix Architecture: Blocking Maximum Transmission Speeds:

Data: 19,200 bit/sec
Advanced Features: User
Programmable, 7-1 Carrier Interface,
LAN Capability (Micro/Mini), Voice
Store and Forward, OA, Diagnostics,
Data Security, RJE to Hoet Interface,
Protocol Conversion
Advanced Attendent Features:
Integrated Communicanications,
Data Switching
Prices:
Purchases: \$200 to \$600

Distribution Method: End user, Third-party Date First Installed: 1983 (See Vendor Profile Page V-7)

### CONVERSATIONAL VOICE TERMINAL CORP. CON MODE VOICE TERMINAL Equipment Type: ACD Transmission: Voice Switch Technology: Analog/Digits

Switch Technology: Analog/Digital Advanced Features: User Programmable, Voice Store and Forward, OA Price: Lease: \$200 to \$300 Purchase: \$4,000 to \$6,000

Distribution Method: End user Date First Installed: March 1984 (See Vendor Profile Page V-8) CROSSPOINT SYSTEMS, INC.

SD450 Equipment Type: Data Switch Transmission: Data Switch Technology: Analog Washmum Trunks Supported: 256 Maximum Trunks Supported: 256 Attendant Consoles (Maximum): 1 Matrix Architecture: Nonblocking, 100%

Maximum Simultaneous Transmissions: 256 Maximum Transmission Speeds: Data: 19,200 bit/sec Advanced Feetures: User Programmable, Diagnostics Distribution Method: End user Number installed to Date: 50 to 100 Date First Installed: September 1982 (See Vendor Profile Page V-8)

# CXC CORP.

Equipment Type: PBX
Transmission: Integrated Voice/
Data
Switch Technology: Digital
Switching Metrix: Trme/Space/Time
Modulation Method: PCM
Maximum Statione Supported:
12,288
Attendant Consoles (Maximum):

Attendant Consoles (Maximum): 192 Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 12,000 Maximum Transmission Speeds:

Volice: \$12,000 bit/sec
Advanced Features: User
Advanced Features: User
Programmable, Digitizes at Handset
(End-to-End Digital), T-1 Carrier
Interface, X.25 Interface, LAN
Capability (Micro-Mini/Mainframe),
Volce Store and Forward, OA,
Security, Diagnostics, Data Security,
RJE to Host Interface, Protocol
Conversion
Distribution Method: OEM
Date First Installed: December 1983
(See Vendor Profile Page V-8)

### DATAPROBE, INC. 3274 CONTROLLER BACKUP

SWITCH
Equipment Type: Coaxial Switch
Transmission: Data
Switch Technology: Analog/Digital
Switch Technology: Analog/Digital
Switching Matrix: Magnetic Latching
Maximum Stations Supported: 128
Matrix Architecture: Bicching
Advanced Features: X.25 Interface,
Diagnostics, Data Security
Distribution Method: End user
Number Installed: Date: 1 to 10
Date First Installed: October 1982
See Vendor Profile Page 1-9)

# DATA SWITCH CORP.

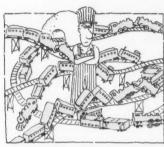
Equipment Type: Analog Switch Transmission: Voice, Data Switch Technology: Digital Maximum Trunks Supported: 72 Maximum Stations Supported: 1,024 Attendent Consoles (Maximum):

Attendent Consoles (Maximum): 7
Matrix Architecture: Blocking
Mazimum Simultaneous
Transmissions: 1,024
Maximum Transmission Speeds:
Data: 19,200 bit/sec

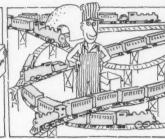
Advanced Features: User Programmable, Security, Diagnostics Advanced Attendant Features: CMS Control Console, Controls 16 ANA-MAX, XV-MAX Switches Distribution Method: End user Date Pirst Installed: April 1983 (See Vendor Profile Page V-9)

# WHEN IT COMES TO CONTROLLING YOUR DATA NETWORK,

# THE IDX-3000™ PUTS YOU ON THE RIGHT TRACK.







Control can be a major problem with a large network. That's why our IDX-3000 Local Communication System features the IDX-Net" network controller. With IDX-Net, you handle configuration management online. You can manage major network topology changes, such as disaster recovery, with only a few keystrokes.

IDX-Net lets you access network control commands and diagnostics from any terminal in the network, including dial-up. This means that you, or M/A-COM Linkabit's Hotline Service, can diagnose your problem in seconds without having to be in your computer room.

**Programmability** 

IDX-Net's 68000-based network controller software provides you with the capability to interface host-resident application programs to the network. You can build-in your own custom-tailored network management features.

### User convenience

In addition to traditional data PABX port contention and resource selection, IDX-Net provides your authorized users with many of the features offered by modern telephone

systems. They can connect, disconnect and hold lines to multiple computer resources and execute third-party connects.

### For the office of now

With the IDX-3000, you can start with a small system that fits your current needs and budget, then grow to obtain non-blocking, full-duplex asynchronous communication for as many as 3072 lines, all at data rates of up to 19.2 Kbps. The IDX-3000's proven TI-based technology is faull-tolerant, with optional redundancy features throughout its distributed architecture, and automatic, continuous self-testing. The IDX-3000 isn't one of those products of the future. It's here now—proven, in use, and backed by M/A-COM, one of the nation's largest communication companies.

If you want to get control of your network, contact Ruth Stoffel at M/A-COM Linkabit, 33 Science Park Road, San Diego, CA 92121, toll-free (800) 626-6640 or (619) 457-2340. We'll put you in control.

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THE NETWORK YOU CAN CONTROL



### DATA SWITCH CORP.

MODEL 800 **Equipment Type:** Computer/Peripheral Switch Computer/Perpheral Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 4 Maximum Stations Supported: 12 Maximum Trans

Data: 8,000,000 bit/sec ocad Attendent Fas be Upgraded to Model 1200, Larger Matrix Size and CMS Controlled Distribution Method: End user Date First Installed: December 1983

DATA SWITCH CORP. **MODEL 1000** Equipment Type: Computer/Peripheral Switch Computer/Peripheral Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Stations Supported: 46 Attendent Consoles (Maximum): 7 Maximum Simultaneous Transmissions: 16 ilon Spe Meximum Transm

Data: 8,000,000 bit/sec Advanced Features: User Programmable, Security, Diagnostics Advanced Attendant Features: CMS Controlled Console Operates 56 Model 1000 Units, Switches at Remote and Local Sites Distribution Method: End user Date First Installed: 1978

DATA SWITCH CORP.

MODEL 1200 **Equipment Type:** Computer/Peripheral Switch Computer/repreted Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Stations Supported: 24 Attendent Consoles (Maximum): 7 Maximum Simulti

Data: 8,000,000 bit/sac Advanced Features: User Programmable, Security, Diagnostics Advanced Attendent Features: CMS Controlled Console, Operates 56 Model 1200 Units, Switches at Remote and Local Sites Distribution Method: End user Date First Installed: 1978

DATA SWITCH CORP XV-MAX-2840

Equipment Type: Data Switch Transmission: Data Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 512 Maximum Stations Supported: 512 Attendant Concoles (Maximum): 7 Matrix Architecture: Nonblocking, 100%

Minstenson Trans Data: 72,000 bit/sec **Advanced Features: User** Programmable Advanced Atte dant Features: CMS Control Console, Controls 16 XY-MAX, ANA-MAX Switches Average Monthly Maintenance: \$75 Distribution Method: End user

DAYCOM CORP. DAYCOM

Equipment Type: PBX
Transmission: Nonintegrated Voice/
Data, Integrated Voice/Data
Switch Technology: Digital Switching Matrix: Time Division,

Modulation Method: PCM Attendant Consoles (Maximum): 10 Matrix Architecture: Nonbiocking. 100% Maximum Transmission Speeds:

Voice: 256,000 bit/sec Distribution Method: End user Number Installed to Date: More than 100 (See Vendor Profile Page V-10)

SYSTEM 3LS NETSWITCH SYSTEM SLS NETSWITCH Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Metrix: STDM Maximum Trunks Supported: 11 Meximum Stations Supported: 1,472

Attendant Consoles (Maximum): 1 Matrix Architecture: Nonblocking Maximum Transmission Speed Data: 9,600 bit/sec

Advanced Features: User Programmable, OA, Security, Diagnostics, Energy Control/Management Distribution Method: End user, OEM, Third-party Number installed to Date: 10 to 25 Date First Installed: January 1982 (See Vendor Profile Page V-10)

DEVELCON ELECTRONICS.

9002 DATA SWITCH Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Metrix: Time/Space/Time Maximum Stations Supported: 284 Metrix Architecture: Nonblocking Maximum Simult Transmissions: 141 Maximum Transmission Speeds:

Data: 19,200 bit/sec Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe) Security, Diagnostics, Data Security, BJE to Host Interface, Protocol Conversion Number installed to Date: More than 100 Date First Installed: 1978 (See Vendor Profile Page V-10)

DEVELCON ELECTRONICS, 9006 DATA SWITCH Equipment Type: Data Switch

Transmission: Data Switch Technology: Analog/Digital Switching Matrix: Time Division Maximum Stations Supported: 2,012 Matrix Architecture: Nonblocking,

100% Transmissions: 2,012

Maximum Transmission Speeds: Data: 19 200 hit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, LAN Capability (Micro/Mini/ Mainframe). Security, Diagnostics. Data Security, RJE to Host Interface **Advanced Attendent Features:** X.25 Interface, Protocol Converter Distribution Method: End user than 100 Date First Installed: September

DIGILOG, INC. NETWORK ACCESS SWITCH (NAS) Equipment Type: Data Switch Transmission: Data, Four-Wire Leased Liries Switch Technology: Analog/Digital Switching Matrix: Time Division Maximum Stations Supported: 240 Attendant Consoles (Maximum): 2 Matrix Architecture: Nonblocking, 100%

Maximum Transmission Speeds: Voice: 9,600 bit/sec Data: 192 hit/sec Purchase: \$600 to \$700

verage Monthly Ma \$500 Distribution Method: End user Date First Installed: February 1984 (See Vendor Profile Page V-10)

DIGITAL CONTROLS CORP. DIGITAL CONTROLS 3403 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Stations Supported: 8

Purchase: \$985 to \$19,500 Distribution Method: End user Number installed to Date: More than 100 Date First Installed: September (See Vendor Profile Page V-10)

DIGITAL CONTROLS CORP. DIGITAL CONTROL 3421 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Stations Supported: 8 Price: Purchase: \$985 to \$19,500 Distribution Method: End user Number installed to Date: 50 to 100 Date First installed: 1982

DIGITAL CONTROLS 4101 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Stations Supported: 8

Purchase: \$935 to \$19,500 Distribution Method: End user Number installed to Date: 10 to 25 Date First installed: 1983

DIGITAL LABORATORIES, INC.

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Modulation Method: Operational Amplifiers Maximum Trunks Supported: 3 Maximum Stations Supported: 3 Attendent Consoles (Maximum): 3

Purchase: \$395 Distribution Method: End user Number Installed to Date: More Date First Installed: 1977 (See Vendor Profile Page V-10)

DIGITAL LABORATORIES, INC. MICRO MATRIX Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Amplifiers Maximum Trunks Supported: 8

Maximum Stations Supported: 8
Attendant Consoles (Maximum): 8
Maximum Simultaneous Transmissions: 8 Purchase: \$995

Number Installed to Date: More then 100

DIGITAL LABORATORIES, INC. MICRO MATRIX II Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Modulation Method: Operational Amplifiers Meximum Trunks Supported: 8 Maximum Stations Supported: 6 Attendant Consoles (Maximum): 8

Distribution Method: End user Number Installed to Date: More

DIGITAL LABORATORIES, INC.

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Modulation Method: Operational Amplifiers Maximum Trunks Supported: 3 Maximum Stations Supported: 3 Attendant Consoles (Maximum): 3

Purchase: \$245 Distribution Method: End user Number Installed to Date: More Date First Installed: 1982

DIGITAL LABORATORIES, INC.

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Modulation Method: Operational Modulation mounts
Amplifiers
Maximum Trunks Supported: 5
Maximum Stations Supported: 5
Attendant Consoles (Maximum): 5

Price:
Purchase: \$395
Distribution Method: End user
Number Installed to Date: 50 to 100
Date First Installed: 1983

SELECT 8

Equipment Type: Data Switch Transmission: Data Switch Technology: Analog Maximum Stations Supported: 8

Purchase: \$335 to \$420 Distribution Method: End user. OEM, Third-party d to Date: More than 100 Date First Installed: September (See Vendor Profile Page V-11)

DYNATECH DATA SYSTEMS CHANNEL ACCESS SWITCH Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 16

Purchase: \$400 to \$6,000 Number installed to Date: 50 to 100 (See Vendor Profile Page V-11)

DYNATECH DATA SYSTEMS

**CTM 1000** CTM 1000 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Time/Spaca/Time Maximum Stations Supported: 16

Purchase: \$400 to \$6,000 Distribution Method: End user Number installed to Date: 10 to 25

DYNATECH DATA SYSTEMS

CTM 1000 MATRIX Equipment Type: Data Switch Transmission: Voice, Data, Integrated Voice/Data Switch Technology: Digital Switching Matrix: Time Division, ace Divsion Modulation Method: Analog Maximum Stations Support Attendant Consoles (Maximum): 16 Matrix Architecture: Nonblocking. 100%

Voice: 1,000,000 bit/sec Data: 64,000 bit/sec Advanced Features: User Programmable, Digitizes at Hands (End-to-End Digital), LAN Capability (Micro/Min/Mainframe), Security, Diagnostics, Data Security Advanced Attendant Features: Storage Capability, Loading

Reconfiguration, LED Alarm

Purchase: \$500 Distribution Method: End user, Third-party Number Installed to Date: 10 to 25 Date First Installed: 1983

DYNATECH DATA SYSTEMS DYNASWITCH

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 16

Purchase: \$400 to \$6,000 Distribution Method: End user Number Installed to Date: More

DYNATECH DATA SYSTEMS DYNASWITCH MARK II

Transmission: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 16

Purchase: \$400 to \$6,000 Distribution Method: End user Number Installed to Date: More than 100

DYNATECH DATA SYSTEMS VS CHANNEL ACCESS SWITCH Equipment Type: Data Switch Transmission: Data Switch Technology: Analog Maximum Stations Supported: 16

Purchase: \$400 to \$6,000 Distribution Method: End user Number Installed to Date: 25 to 50

DYNATECH PACKET TECHNOLOGY, INC.

**MULTI SWITCH X.2** MULTI SWITCH X.2 Equipment Type: Packet Processor Transmission: Data Switch Technology: Digital Switching Martin: Time Division Maximum Trunks Supported: 127 Matrinx Matterns Supported: 127 Matrix Architecture: Nonblocking,

Maximum Simultane Transmissions: 127 Maximum Transmis ion Speeds: Data: 14,400 bit/sec

Advanced Features: User
Programmable, X.25 Interface, LAN
Capability (Micro/Mini/Mainframe), Security, Diagnostics, Data Security, Protocol Conversion

Purchase: \$4,000 Distribution Method: End user Number Installed to Date: More than 100 Date First Installed: June 1982 (See Vendor Profile Page V-11)

ELECTRODATA, INC. CLS 2

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported; 2

Purchase: \$125

Distribution Method: Third-party Number Installed to Date: More than 100

Date First Installed: December 1976 (See Vendor Profile Page V-11) ELECTRONIC INTERFACE

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 5

Purchase: \$100 to \$259 Distribution Method: End user Number Installed to Date: More Date First Installed: 1980 (See Vendor Profile Page V-11)

ELECTRONIC INTERFACE ASSOCIATES

5 24 5 24 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 5

Purchase: \$100 to \$259 Distribution Method: End user Number Installed to Date: More than 100

ERICSON PROGMATIC, INC.

ERIPAX Equipment Type: Packet Processor Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 1,500 Maximum Stations Supported: Matrix Architecture: Nonblocking,

100% Maximum Simultaneou Transmissions: 1,500 Maximum Transmissio

Data: 16,000 bit/sec Advanced Features: X.25 Interface, LAN Capability (Micro/Mini/ Mainframe), OA, Diagnostics, Data Security, Energy Control/Management, Protocol Conversion

Lease: \$30 to \$40 Lesse: \$30 to \$40 Purchase: \$1,600 to \$1,800 Distribution Method: End user Number Installed to Date: 10 to 25 Date First Installed: January 1983 (See Vendor Profile Page V-11)

GANDALF DATA, INC. PACK TM Equipment Type: PACX Transmission: Data Switch Technology: Digital Switching Matrix: Time Division, Space Divsion Maximum Trunks Supported: 1,024 Maximum Stations Supported: 2.048 Attendent Consoles (Maximum): 1 Matrix Architecture: Nonblocking,

100% Maximum Simultaneous Transmissions: 1,024 Maximum Transmission:

Data: 19,200 bit/sec

Advanced Features: User Programmable, T-1 Carrier Interface. X.25 Interface, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion

Purchase: \$135 to \$500 Average Monthly Main Distribution Method: End user Number installed to Date: More

than 100 (See Vendor Profile Page V-12)

GTE BUSINESS COMMUNICATIONS SYSTEMS, INC. Equipment Type: PBX Transmission: Voice, Data, Integrated Voice/Data Switch Technology: Digital Switching Matrix: Time Division, Space Division
Modulation Method: PCM
Maximum Trunks Supported: 4,608
Maximum Stations Supported:

12 288 Attendent Consoles (Maximu Matrix Architecture: Blocking Maximum Simultaneous Transmissions: 4,608 Maximum Trans

Data: 64,000 bit/sec Advanced Feetures: User
Programmable, Digitizes at Handset
(End-to-End Digital), T-1 Carrier
Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainf Voice Store and Forward, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Advanced Attendant Features: Dual Bus Architecture

Purchase: \$300 to \$500
Distribution Method: End user
Number Installed to Date: 50 to 100
Date First Installed: September (See Vendor Profile Page V-13)

SYSTEMS, INC. OMNI PBX Equipment Type: PBX Transmission: Voice, Data, Integrated Voice/Data Switch Technology: Digital Switching Matrix: Time Division, System Division
Modulation Method: PCM
Maximum Trunks Supported: 1,024
Maximum Stations Supported: Attendant Consoles (Maximum): 8 Matrix Architecture: Blocking Maximum Simultaneous Transmissions: 384 um Trans

Data: 64,000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), Voice Store and Forward, QA.

Security, Diagnostics, Data Security, RUE to Hoet Interface, Protocol Conversion Advanced Attendant Feetures: Dust Bus Architecture Distribution Method: End user Number Installed to Date: More than 100 Date State Installed: September

NARRES CORP.
400-L (4001-2 AC OR DC)
Equipment Type: PABX
Transeniseion: Nonintegrated Voice/
Data
Switch Technology: Digital
Switch Technology: Digital
Switching Methics: Time Division
Micchaletion Method: DM
Meximum Trunks Supported: 56
Maximum Statione Supported: 440
Attendant Corsoles (Maximum): 2
Methic Architecture: Blocking
Maximum Simultaneous
Transeniseione: 145

Maximum Transmission Spee Data: 9,600 bit/sec Advanced Features: User Programmable, LAN Capability (Micro/Mini/Mainframe), Data Security

Purchase: \$320 to \$500 Distribution Method: Third-party Number Installed to Date: 1 to 10 Date First Installed: January 1984 (See Vendor Profile Page V-14)

PLANTUS CORP.
400-Mi (400M-2 AC OR DC)
Equipment Type: PABX
Transmission: Nonintegrated Voice/
Data
Switch Technology: Digital
Switching Metrics: Time Division
Micolausion Method: DM
Maximum Trunks Supported: 32
Maximum Statione Supported: 216
Attendent Consoles (Maximum): 2
Metrix Architecture: Nonbiocking.

100% Maximum Simultaneous Transmissions: 145 Maximum Transmission Speeds

Data: 9,600 bit/sec Advanced Features: User Programmable, LAN Capability (Micro/Mini/Meinframe), Data Security Price:

Purchase: \$350 to \$500 Distribution Method: Third-party Number installed to Date: 1 to 10 Date First Installed: January 1984

BLANRIS CORP.
1201 (1201-3 AC OR DC)
Equipment Type: PABX
Transeriseion: Nonintegrated Volos/
Data
Switching Metric: Time Division
Nocularition Method: DM
Maximum Trunks Supported: 48
Maximum Stations Supported: 448
Attendant Consoles (Maximum): 4
Metrix Architecture: Diochemics (Maximum): 4
Metrix Architecture: Diochemics (Maximum): 1
Transervisiones: 145

Maximum Transmission Speeds: Deta: 9,600 bit/sec Advanced Feetures: User Programmable, LAN Capability (Micro/Min/Meinfarme), Data Security Price: Purchase: \$350 to \$500 Distribution Method: End user

Purchase: \$350 to \$500
Distribution Method: End user
Humber Installed to Date: 8,000
Date First Installed: January 1975

HARRIE CORP.
1202 (1202-6 AC OR DC)
Equipment Type: PABX
Transmission: Nonintegrated Voice/
Data
Switch Technology: Digital
Switching Metrits: Time Division
Modulation Method: DM
Maximum Trunks Supported: 128
Metrix Architecture: Biocking
Maximum Simultone Supported: 928
Metrix Architecture: Biocking
Maximum Simultaneous
Transmissions: 145
Maximum Transmission Speede:

Data: 9,600 bit/sec Advanced Features: User Programmable, LAN Capability (Micro/Mini/Mainframe), Data Security Price:

Purchase: \$290 to \$500
Distribution Method: End user
Number Installed to Date: 8,000
Number Installed to Date: More
than 100
Date First Installed: June 1977

HARRIS CORP. 1204/1204-6 DC Equipment Type: PACX Tranemission: Nonintegrated Voice/ Data

Data
Switch Technology: Digital
Switching Matrix: Time Division
Modulation Method: DM
Maximum Trunks Supported: 120
Maximum Stations Supported: 840
Matrix Architecture: Noriblocking,
100%
Maximum Simultaneous

Maximum Simultaneous Transmissions: 145 Maximum Transmission Speeds: Data: 9,600 bit/sec

Advanced Features: User Programmable, LAN Capability (Micro/Mini/Mainframe), Data Security Price: Purchase: \$400 to \$550

Distribution Method: Third-party Number installed to Date: More than 100 Date First installed: October 1978

HARRIS CORP. 1205/1205-3 DC

Equipment Type: PABX Transmilesion: Nonintegrated Voice/ Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: DM Maximum Tranks Supported: 56 Maximum Stations Supported: 320 Matrix Architecture: Norblocking, 100% Transmissions: 145
Maximum Transmission Speeds:
Data: 9,600 bit/sec
Advanced Festures: User Programmable, LAN Capability (Micro/Min/Mainframe), Data Security
Price:

Purchase: \$450 to \$600 Distribution Method: Third-party Number installed to Date: More than 100 Date First Installed: May 1979

HARRIS CORP.
HARRIS 1105 & 110M
Equipment Type: PBX
Transmission: Nonintegrated Voice/
Data
Switch Technology: Analog
Switching Matrix: Time Division
Modulation Method: PAM
Maximum Trunks Supported: 111
Attendant Conceles (Maximum): 1
Matrix Architecture: Blocking

Maximum Simultaneous Transmissions: 30 Maximum Transmission Speeds: Data: 9,600 bit/sec Advanced Features: Data Security

Purchase: \$650
Distribution Method: OEM, Thirdparty
Number Installed to Date: More than 100
Date Pirst Installed: April 1982

HITACHI AMERICA, LTD. DX 30/40 Equipment Type: PBX Transmission: Nonintegrated Voice/ Data Switch Technology: Digital

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 256 Maximum Statione Supported: 1,272 4ttendant Consoles (Maximum): 8

Attendant Consoles (Maximum): Maximum Simultaneous Transmissions: 128 Maximum Transmission Speeds: Voice: 19,200 bit/sec Data: 19,200 bit/sec Advanced Features: User Programmable, Voice Store and

Frogramman, voice state and Forward, OA, Diagnostics Distribution Method: Third-party Number installed to Date: 50 to 100 Date First Installed: 1982 (See Vendor Profile Page V-14)

I P C TECHNOLOGY, LTD.
DPX III (100, 160, 1000)
Equipment Type: PABX
Transantesion: Nonintegrated Voice/
Data
Switch Technology: Digital
Switching Metrix: Time Division
Modulation Method: PWM
Maximum Trunks Supported: 1,000
Maximum Stations Supported: 1,000
Attendant Consoles (Maximum): 4
Metrix Architecture: Nonblocking,

Maximum Simultaneous

Transmissions: 500 Maximum transmission Speeds: Volce: 9,600 bit/sec Date: 9,600 bit/sec Advanced Feebuse: Use Transmission Speeds: Volce: 9,600 bit/sec Advanced Feebuse: Use Transmission Store and Forward, OA, Security, Disgnostics, Data Security, Rail: to Hoot Interface Advanced Attendant Feebuse: 40-Key Programmable Console Advanced Attendant Feebuse: Electronic Key Set Average listoribly Maintenance: \$4 Diseribution Method: End user, Third-party Number Installed: 1979 Number Installed: 1979 |

Date First Installed: 1979 |

See Vehood: Profile Rage V-14)

IDEOGRAPHIX, INC.
IPX 5410
Equipment Type: Message Switch
Transmission: Data
Switch Technology: Digital
Switching Matrix: Interrupt
Modulation Method: Multiplexer
Maximum Trunks Supported: 126
Attendant Consolee (Maximum):
256

Matrix Architecture: Blocking Mastrinum Simultaneous Transmissions: 1 Maximum Transmissions: 1 Maximum Transmission Speeds: Data: 9,600 bit/sec Advanced Features: X-25 Interface, Security, Diagnostics, Protocol Conversion Distribution Method: Third-party Number Installed to Date: 1 to 10 Date First Installed: 1972 (See Vendor Profile Page V-15)

INFORMATION DYNAMICS
CORP.

DX 230
Equipment Type: PBX
Transmission: Voice, Transparent to
Data
Switching Matrix: Space Division
Maximum Trunka Supported: 10
Maximum Stations Supported: 30
Attendent Concoles (Maximum): 2
Matrix Architecture: Nonblocking,
100%

Maximum Simultaneous Transmissions: 14 Distribution Method: Third-party Number installed to Date: More than 100 Date First installed: 1973 (See Vendor Profile Page V-15)

INFORMATION DYNAMICS
CORRE,
IDX 2120
Equipment Type: PBX
Transmission: Voice, Transparent to
Data
Switching Matrix: Space Division
Maximum Trunks Supported: 120
Maximum Stations Supported: 30
Attendant Consoles (Maximum): 2
Matrix Architecture: Nonbiocking,
100%
Maximum Simultaneous

Maximum Simultaneous Transmissione: 14 Advanced Features: Diagnostics

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Distribution Method: Third-party Number installed to Date: More then 100 Date First In

POTRON SYSTEMS CORP. IS 4000/4002 INTELLIGENT SWITCHING SYSTEM Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Space/Time/ Space Meximum Stations Supported:

4.000 Attendant Consoles (Maximum): 2 Matrix Architecture: Nonblocking, 100%

Maximum Sino Transmissions: 2,000 cimum Trans

Data: 64 000 hit/sec Advanced Features: User Programmable, LAN Capability (Micro/Mini/Mainframe), OA, Security, Diagnostics, Data Security, R.IF to Host Interface Price:

Lease: \$9 to \$15 Purchase: \$140 to \$240 Distribution Method: End user Number Installed to Date: More Date First Installed: November 1981 (See Vendor Profile Page V-16)

Equipment Type: IBX Transmission: Integrated Voice/ Data Switch Technology: Digital Switching Metric: Time Division Medulation Method: PCM Maximum Trunks Supported: 8,192 8 102 Attendent Consoles (Maximum): 16 Metrix Architecture: Nonblocking, 100%

Maximum Sim Transmissions: 8,192 Maximum Transmission Speeds: Voice: 64,000 bit/sec

Data: 10.000.000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, Voice Store and Forward, OA, Diagnostics, RJE to Host Interface, Integrated

Purchase: \$1,000 Distribution Method: End user Number Installed to Date: 25 to 50 Date First Installed: September 1981 (See Vendor Profile Page V-16)

INTELLIGENT BUSINESS SYSTEMS, INC. **CSX 1024** 

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Time Division leximum Trunks Supported: 2,048 faximum Stations Supported: 2.048

ent Consoles (Maximum): 10 etrix Architecture: Nonblocking, 100%

Transmissions: 512 Maximum Tren

Data: 64,000 bit/sec Programmable, Digitizes at Handset (End-to-End Digital), X.25 Interface, LAN Capability (Micro/Mini/ Mainframe), Diagnostics, Data Maintainey, Degridules, Data Security, Protocol Conversion Distribution Method: End user Number installed to Date: 1 to 10 Date First Installed: January 1984 (See Vendor Profile Page V-16)

INTERCONNECT PLANKING

**DPX 100** Equipment Type: PABX Transmission: Integrated Voice/ Data

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PWM Maximum Trunks Supported: 88 Maximum Stations Supported: 88 Attendant Consoles (Maximum): 2 Metrix Architecturs: Nonblocking, 100%

Transmissions: 44 Maximum Trans Voice: 9,600 bit/sec

Data: 9.600 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, LAN Capability (Mainframe), Security, Diagnostics

Price:
Purchase: \$600 to \$900
Distribution Method: End user
Number Installed to Date: 50 to 100
Date First Installed: September 1977

(See Vendor Profile Page V-16)

INTERCONNECT PLANNING

DPX 160 Equipment Type: PABX Transmission: Integrated Voice/ Data

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PWM Maximum Trunks Supported: 152 Maximum Stations Supported: 152 Attendent Consoles (Maximum): 2 Metrix Architecture: Nonblocking,

Transmissions: 76 Maximum Transmi ion Speeds:

100%

Data: 9,600 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, Voice Store and Forward, Security, Diagnostics

Purchase: \$600 to \$900 Distribution Method: End user Number Installed to Date: More Date First Installed: January 1977 INTERCONNECT PLANNING DPX 1000

Equipment Type: PABX nission: Integrated Voice/

Switch Technology: Digital Switching Metrix: Time Division Modulation Method: PV/M Maximum Trunks Supported: 1,016 Maximum Stations Supported: 1,016

Attendant Consoles (Maximum): Metrix Architecture: Nonbiocking. 100%

Transmissions: 508 Maximum Trans

Vision: 9 600 bit/sec Data: 9,600 bit/sec Advanced Features: User Programmable, Digitizes at Handeet (End-to-End Digital), T-1 Carrier Interface, Voice Store and Forward, Security, Diagnostics, Data Security

Purchase: \$600 to \$1,200 Distribution Method: End user Number Installed to Date: More than 100 Date First installed: January 1977

ITT BUSINESS MUNICATIONS CORP. SYSTEM 3100

Equipment Type: PBX
Transmission: Nonintegrated Voice/ Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 288 Maximum Stations Supported: 288
Attendant Consoles (Maximum): 4
Matrix Architecture: Nonblocking
Maximum Simultaneous Transmissions: 190

Maximum Transmiss Voice: 9,600 bit/sec Data: 56,000 bit/sec Advanced Features: User Programmable, Diagnostics, Protocol Conversion

Purchase: \$600 to \$850 Average Monthly Maintenance: Distribution Method: End user Number Installed to Date: More than 100 Date First Installed: January 1981 (See Vendor Profile Page V-17)

ITT TELECOM PRODUCTS.

1210 SYSTEM Equipment Type: Data Switch Transmission: Integrated Voice/ Data Switch Technology: Digital Switching Matrix: Time/Space/Time Modulation Method: PCM Maximum Trunks Supported: 15 Maximum Stations Supported: 50,000 endant Consoles (Maximum): 120

Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 7.500

um Tren

Voice: 64,000 bit/sec Data: 64,000 bit/sec Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, Voice Store and Forward, Diagnostics, Data Security Distribution Method: End user Number Installed to Date: More

than 100 Date First Installed: 1978 (See Vendor Profile Page V-17)

ITT TELECOM PRODUCTS,

1240 Equipment Type: DCU Transmission: Integrated Voice/

Switch Technology: Digital Switching Matrix: Time Division, Space Division

Modulation Method: PCM Maximum Trunks Supported: 60,000 m Stationa Supported:

100,000 nt Consoles (Maximum): 300

Metrix Architecture: Nonbiocking Meximum Simultaneous Transmissions: 12,000 Maximum Trans Voice: 64,000 bit/sec

Data: 4,000,000 bit/sec Advanced Features: User
Programmable, Digitizes at Handest
(End-to-End Digital), T-1 Carrier
Interface, X.25 Interface, LAN Capability (Micro/Mini/Ma Voice Store and Forward, OA, Security, Diagnostics, Data Security, Energy Control/Management, Protocol Conversion

Purchase: \$200 to \$300 Distribution Method: End user Number installed to Date: 10 to 25 Date First installed: 1981

ITT TELECOM PRODUCTS, DPS 1500

Equipment Type: Packet Processor Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 1,000 Maximum Simult Transmissions: 2,000

Data: 25,600 bit/sec Advanced Features: User Programmable, X.25 Interface. Security, Diagnostics, Protocol Conversion, IBM 3270, 2780, X.27 Interface Distribution Method: End user

Number installed to Date: 10 to 25 Date First Installed: 1981

IWATSU AMERICA, INC. OMEGA IV IDS-128 **Equipment Type: Hybrid** Transmission: Integrated Voice/ Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 36 Maximum Stations Supported: 128 Attendant Consoles (Maximum): 2 Matrix Architecture: Nonbiocking, 100%

100%
Maximum Simultaneous
Transmissions: 128
Advanced Features: User
Programmable, Digitizes at Handset
(End-to-End Digital), Voice Store and
Forward, OA, Diagnostics, Data

Advanced Attendant Features: Voice Synthesis, Station to Station, Facsimile

Distribution Method: Third-party Number Installed to Date: More than 100

Date First Installed: February 1983 (See Vendor Profile Page V-17)

TWATSU AMERICA, INC.
OMEGA III MODEL 412
Equipment Type: Key System
Transmisation: Voice, Data
Switch Technology: Analog/Digital
Switching Matrix: Space Divsion
Moduletion Method: PAM Maximum Trunke Supported: 4 Maximum Statione Supported: 12 Attendant Consoles (Maximum): 1 Matrix Architecture: Nonblocking, 100%

Maximum Simultane Transmissions: 4 Advanced Features: Liner Programmable, LAN Capability (Micro/Mini) (Micro/Ann)
Advanced Attendant Features:
Message Connect/Override
Distribution Method: Third-party
Number Installed to Date: More

than 100 **Date First installed: 1979** 

IWATSU AMERICA, INC. OMEGA III MODEL 816 OMECA in MCOULE. 818 Equipment Type: Key System Transmission: Voice, Data Switch Technology: Analog/Digital Switch Technology: Analog/Digital Switchling Matrix: Space Division Macdimum Trunks Supported: 8 Maximum Stations Supported: 8 Maximum Stations Supported: 18 Attendant Consoles (Maximum): 1 Matrix Architecture: Nonbiocking, 100%.

Transmissions: 8 Advanced Features: LAN Capability (Micro/Mini) **Advanced Attendent Features:** Message Connect/Override Distribution Method: Third-party Number Installed to Date: More then 100 Date First Installed: 1979

IWATSU AMERICA, INC. OMEGA IV ES-824/1648 **Equipment Type:** Hybrid Tra mission: Integrated Voice/ Switch Technology: Analog Switching Metrix: Space Division Maximum Trunks Supported: 16 Maximum Stations Supported: 48 Attendant Consoles (Maximum): 2

Transmissions: 24 Advanced Features: User Advanced Feetures: User Programmable, Voice Store and Forward, OA, Diagnostics Advanced Attendant Feetures: Voice Synthesis, Hand-Free Reply Distribution Method: Third-party Date First Installed: January 1984

Matrix Architecture: Nonblocking.

100%

OMEGA III MODEL 2480 OMEGA III MODEL 2460
Equipment Type: Key System
Transmission: Voice, Data
Switch Technology: Analog/Digital
Switchling Matrix: Space Division
Modulation Method: PAIM
Macdimum Trunks Supported: 20
Maximum Stations Supported: 20
Attendant Conceles (Maximum): 2
Matrix Architecture: Nonblocking,
100% 100% 1007/s
Maximum Simultaneous
Transmissions: 20
Advanced Festures: LAN Capability
(Micro/Mini)
Advanced Attendant Festures:
Cal-Valting, Message
Connect/Durenties Connect/Override
Distribution Method: Third-party
Number Installed to Date: More

M/A-COM, INC. M/A-COM, INC.
IDX 3000
Equipment Type: CBX
Transmission: Data
Switch Technology: Digital
Switching Metric: Time Division
Modulation Method: Dipolar
Maximum Trunks Supported: 128
Maximum Stations Supported: 2729 3 072 Matrix Architecture: Nonblocking.

Date First Installed: 1979

Maximum Simulti

than 100

Transmissions: 3,072 Maximum Transmission Speeds: Advanced Features: User
Programmable, Digitizes at Handset
(End-to-End Digital), T-1 Carrier
interface, LAN Capability (Micro/Mini/ Mainframe), Security, Diagnostics, Data Security, Energy Control/Management, RJE to Host Interface, Protocol Conversion Advanced Attendant Features: Optional, Autoband Terminals, On-Line Reconfiguration

Purchase: \$200 Distribution Method: OEM, Thirdparty Number installed to Dete: 25 to 50 Date First Installed: October 1982 (See Vendor Profile Page V-18)

MELCO LABS, INC. MAX-128P MAX-128P Equipment Type: PBX Transmission: Nonintegrated Voice/ Switch Technology: Analog Switching Matrix: Space Divsion Maximum Trunks Supported: 40

Maximum Stations Supported: 128 Attendant Consoles (Maximum): 2 Matrix Architecture: Nonblocking Maximum Simulten Transmissions: 48 Maximum Transmis

Data: 4,800 bit/sec Advanced Features: User Programmable, Security, Disgnostics

Price: Purchase: \$150 Distribution Method: Third-party (See Vendor Profile Page V-19)

ELCO LABS, INC. MAX-212 Equipment Type: PBX Transmission: Nonintegrated Voice/ Data Switch Technology: Analog Switching Matrix: Space Divsion Maximum Trunks Supported: 2 Maximum Stations Supported: 12 Matrix Architecture: Nonblocking Maximum Stations: 3 Maximum Stations: 3 Maximum Stations: 3 Maximum Stations: 3 Maximum Stransmissions: 3 Maximum Stransmissions: 5 Data: 4,800 bit/sec

Price:
Purchase: \$75
Distribution Method: Third-party
Number Installed to Date: More than 100
Path Since Installed: Contember **Date First Installed: September** 

MELCO LABS, INC. MAX-424 Equipment Type: PBX Transmission: Novices sion: Nonintegrated Voice/ Iransmission: Normingrated Voice/ Data Switch Technology: Analog Switching Metric: Space Division Maximum Trunks Supported: 4 Maximum Stations Supported: 24 Attendent Concoles (Maximum): 1 Maximum Simultacture: Norbiocking Maximum Simultaneous Transmissions: 6 mum Tran

salon Speeds: Data: 4,800 bit/sec Advanced Features: User Programmable, Diagnostics

Purchase: \$120 Distribution Method: Third-party Number Installed to Date: More than 100 Date First Installed: July 1980

MELCO LARS, INC. MAX-824 Equipment Type: PBX Transmission: Nonintegrated Voice/ Transmissions: Noruntograted veice/ Data Switch Technology: Ange Divelon Maximum Stations Supported: 12 Maximum Stations Supported: 24 Attendant Consolee (Maximum): 1 Maximum Stations Supported: 24 Attendant Consolee (Maximum): 1 Maximum Stations Supported: 24 Transmissions: 16

Transmissions: 16 Maximum Transmi Data: 4,800 bit/sec Advanced Features: User Programmable, Diagnostics Purchase: \$140 Distribution Method: Third-party Number Installed to Date: More Date First Installed: 1981

MICON SYSTEMS, INC. MICRO 600 Requipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Time Division Maximum Stations Supported: 1,504

1,504 Matrix Architecture: Blocking Maximum Simultaneous Transmissions: 489 Maximum Transmission Spec

Data: 9,600 bit/sec Advanced Features: T-1 Carrier interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe) OA, Security, Diagnostics, Data Security, Protocol Conversion

Purchase: \$100 to \$250 Distribution Method: End user Number Installed to Date: More Date First Installed: November (See Vendor Profile Page V-19)

MITTEL, INC. Equipment Type: PARX Transmission: Integrated Voice/ Transmission: Integrated Voice/
Data
Switch Technology: Digital
Switch Technology: Digital
Switching Mistrix: Space Division
Modulation Method: PAM
Maximum Stations Supported: 6
Mistrix Architectures: Blocking
Advanced Features: User
Programmable, Diagnostics, Data
Searative Protocol Commerciae. Security, Protocol Conversion, Ring Group (See Vendor Profile Page V-20)

MITEL, INC. 8X-10 Equipment Type: PABX Transmission: Integrated Voice/ Data Switch Technology: Digital Switching Matrix: Space Division Medulation Methods: PAM Maximum Trunks Supported: 8 Maximum Stations Supported: 16 Attendant Consoles (Maximums): 1 Matrix Architecture: Blocking Maximum Simultaneous Transmissions: 8 Advanced Features: User Programmable, OA, Security, Diagnostics, Deta Security, Protocol Conversion, External Call Forwarding

Purchase: \$3,000 Distribution Method: Third-party Date First Installed: 1981

MITTEL, INC. 8X-20 Equipment Type: PABX Transmission: Integrated Voice/ itch Technology: Analog

Switching Metrics: Space Division Moduletion Method: PAM Maximum Trunks Supported: 12 Meanimum Stations Supported: 72 Attendent Consoles (Maximum): 2 Metric Architecture: Blocking Advanced Feetures: User Programmable, OA, Security, Diagnostics, Data Security, Protocol Conversion, External Call Forwarding

Purchase: \$8,300 Distribution Method: Third-party Date First installed: January 1980

8X-100 Equipment Type: PABX Transmission: Voice Switch Technology: Analog Switching Metrix: Space Divsion Maximum Trunks Supported: 112 Maximum Stations Supported: 112 Attendent Consoles (Maximum): 2 Metrix Architecture: Blocking Maximum Simult Transmissions: 31

Data: 4,800 bit/sec Advanced Features: User Programmable, Security, Programmable, Security
Diagnositios, Data Security
Distribution allethod: Third-party
Number Installed to Date: 5,000
Date First Installed: 1979

MITTEL, INC. SX-200 Equipment Type: PABX Equipment Type: PABX Transmelsoin: Voice Switch Technology: Analog Switchin Technology: Analog Switching Martirs: Space Division Maximum Stations Supported: 208 Attendent Consoles (Maximum): 2 Metrix Architecture: Blocking Meximum Simultaneous: 31 Transmelsoin: 31 Tranomissions: 31 Maximum Transmission Speeds:

Data: 4.800 bit/sec Advanced Features: User Programmable, Security, Diagnostics, Data Security Distribution Method: Third-party Number Installed to Date: 8,000 Date First Installed: September

### MORGAN DATA SYSTEMS

ANSWERNET Equipment Type: PCM Switch silon: Nonintegrated Voice/ Switch Technology: Digital Switching Metrix: Time Division, Space Divsion odulation Method: PCM Maximum Trunks Supported: 250 Maximum Stations Supported: 20 Attendent Concoles (Maximum): 30 Maximum Simultaneous Transmissions: 24 Maximum Trans ion Spe

Voice: 1,536,000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), LAN Capability (Micro/Mini), Voice Store and Forward, OA, Diagnostics

Advanced Attendant Features: Call Distribution

Purchase: \$275 Distribution Method: End user, Third-party Number installed to Date: 1 to 10 Date First Installed: August 1983 (See Vendor Profile Page V-20) Third-party

MOTOROLA, INC. EXCHANGES

Equipment Type: Cellular Telephone Switch mission: Voice, NonIntegrated Voice/Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Metrix Architecture: Nonblocking Advanced Features: T-1 Carrier Interface, Voice Store and Forward,

Security, Diagnostics
Distribution Method: End user
Number Installed to Date: 10 to 25
Date First Installed: September

(See Vendor Profile Page V-20)

MOTORIOLA, INC. EMX SERIES (RADIO TELEPHONE) Equipment Type: PCM nemission: Integrated Voice/

Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 15,000

um Stations Supported: 200,000 Metrix Architecture: Nonblocking Meximum Simultaneous Transmissions: 7,500 Advanced Features: User Programmable, T-1 Carrier Interface,

Diagnostics, Digital Radio Telephone Distribution Method: End user Mumber Installed to Date: 25 to 50

HETWORK PRODUCTS, INC.

BABYNET Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Switching Matrix: Packet Maximum Trunks Supported: 1
Maximum Stations Supported: 86
Attendant Consoles (Maximum): 64
Matrix Architecture: Nonblocking Transmissione: 22 Maximum Transm ion Speeds:

Data: 9,600 bit/sec Advanced Features: User Programmable, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), OA, Security, Diagnostics, Data Security, RJE to Host Interface, **Protocol Conversion** 

Purchase: \$1,450 Distribution Method: End user Number Installed to Date: More than 100 Date First Installed: 1982 (See Vendor Profile Page V-21)

HORTHERN TELECOM, INC. **CSV 24B** 

CSV 248 Equipment Type: PABX Transmission: Digital Switch Technology: Analog/Digital Switching Matrix: Time Division Matrix Architecture: Nonblocking, 100%

Transmissions: 1 Maximum Transmission Speeds:

Data: 56,000 bit/sec Advanced Features: X.25 Interface, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion
Distribution Method: End user
Number Installed to Date: More than 100 Date First Installed: 1973 (See Vandor Profile Page V-22)

NORTHERN TELECOM, INC.

Equipment Type: C.O. Switch Transmission: Integrated Voice/ Switch Technology: Digital Switching Matrix: Time Division,

Space Division Space Division Modulation Method: PCM Maximum Trunka Supported: 1,120 Maximum Stations Supported: 10.000

strix Architecture: Nonblocking, 100%

Maximum Simultaneo Transmissions: 3.360 Voice: 64,000 bit/sec

Data: 56,000 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, Security, Diagnostics, RJE to Host Interface, **Protocol Conversion** 

Purchase: \$250 to \$500
Distribution Method: End user
Number Installed to Date: 1,000
Date First Installed: September

NORTHERN TELECOM, INC. **DMS 100** 

Equipment Type: C.O. Switch Transmission: Integrated Voice/ Data Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported:

60,000 n Stations Supported 100,000 Matrix Architecture: Nonbiocking.

Transmissions: 61,440 Maximum Trans

Data: 64,000 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, Voice Store and Forward, Security, Diagnostics, RJE to Host Interface, Protocol Conversion Price:

Purchase: \$300 to \$500

Number installed to Date: 600 Date First installed: December 1978

NORTHERN TELECOM, INC. DMS 200

Equipment Type: Toll Tandem Switch Trenemission: Integrated Voice/

Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 60,000

Matrix Architecture: Nonblocking,

Transmissions: 30,000 Maximum Transmission Voice: 64,000 bit/sec

Data: 64 000 hit/sec Advanced Features: T-1 Carrier interface, X.25 Interface, Security, Diagnostics, Data Security, Protocol Conversion

Distribution Method: End user Number Installed to Date: More than 100 Date First Installed: April 1979

NORTHERN TELECOM, INC.

Equipment Type: PABX Transmission: Integrated Voice/ Switch Technology: Digital

Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 500 Maximum Stations Supported: 5,000

Attendent Consoles (Maximum): 15 Matrix Architecture: Blocking Maximum Simultaneous Transmissiona: 1,000 Maximum Transmission Spe

Data: 56,000 bit/sec Advanced Features: Voice Store and Forward, OA, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion

Purchase: \$1,000 to \$2,000 Distribution Method: End user, Third-party Number installed to Date: 6,000 Date First installed: 1976

HORTHERN TELECOM, INC.

SL-100 Equipment Type: PABX Transmission: Integrated Voice/ Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 5,000 Maximum Stations Supported: 30,000 ndant Consoles (Maximum):

255 Matrix Architecture: Nonblocking Maximum Transmission Speeds:

Data: 64,000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), Voice Store and Forward, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion
Distribution Method: End user. Third-party illed to Date: 13 Date First Installed: 1979

OKI ELECTRONICS OF AMERICA, INC. SPECTRUM 100 Equipment Type: PABX Hybrid Key Transmission: Integrated Voice/

Switch Technology: Digital Switching Metrix: Time Division.

Modulation Method: PCM Maximum Trunks Supported: 48 Maximum Stations Supported: 256 Attendent Consoles (Maximum): 2 Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 256

Voice: 8,000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), LAN Capability (Micro/Minl), OA, Diagnostics, Data Security, Protocol Conversion ond Attendant Features: Voice Digital Station, 18 Voice Digital Station, 18
Programmable Function Line Keys,
DDS, BLF Line Appearance
Distribution Method: Third-part 10
Number Installed to Date: 50 to 100
Date First Installed: January 1983
(See Vendor Profile Page V-22)

OKI ELECTRONICS OF SPECTRUM 700 Equipment Type: PABX Transmission: Integrated Voice/

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Modularion Meriod: PCM Maximum Trunks Supported: 176 Maximum Stations Supported: 768 Attendant Consoles (Maximum): 8 Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 256 Maximum Transmission Speeds:

Voice: 8,000 bit/sec Data: 192,000 bit/sec Advanced Features: User Programmable, T-1 Carrier Interface, Voice Store and Forward, OA, inosus ribution Method: Third-party nber installed to Dete: 50 to 100 e First Installed: January 1983

OKI ELECTRONICS OF AMERICA, INC. SPECTRUM 4000 Equipment Type: PABX nission: Integrated Voice/

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM num Trunks Supported: 960 num Stations Supported: 4.096

endant Consoles (Maximum): 24 trix Architecture: Blocking ximum Simultaneous

Transmissions: 960 Maximum Transmission Speeds: Voice: 8,000 bit/sec

Data: 19,200 bit/sec Advanced Features: User Programmable, T-1 Carrier Interface, Voice Store and Forward, OA. ution Method: Third-party

PARADYNE CORP. PDN 5200

PDN 5200 Equipment Type: Packet Processor Transmission: Data Switch Technology: Digital Switching Matrix: Packet Maximum Trunks Supported: 16 Maximum Stations Supported: 10,000

10,000
Attendant Concoles (Maximum): 14
Matrix Architecture: Nonblocking
Maximum Simultaneous
Transmissions: 13,000
Maximum Transmission Speeds: Data: 72,000 bit/sec Advanced Features: User Programmable, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), OA, Security, Diagnostics, Data Security, RJE to Host Interface,

Protocol Conversion

Purchase: \$500 to \$2,000 Distribution Method: End user Number installed to Data: More Date First Installed: January 1982 (See Vendor Profile Page V-23)

T-COMM Equipment Type: PBX mission: Integrated Voice/ Switch Technology: Analog/Digital Switching Matrix: Space Division Medulation Method: PM Maximum Simultaneous sions: 416 Advanced Features: User Programmable, T-1 Carrier Interface, LAN Capability (Micro/Mini/ Mainframe), Security, Diagnostics, Data Security, Energy Control/Management, RJE to Host Interface, Protocol Conversion Distribution Method: End user Number Installed to Date: More than 100 Date First Installed: January 1973 (See Vendor Profile Page V-23)

PHILIPS ELECTRONICS INSTRUMENTS, INC. FLEXPAC

FLEXPAC Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Trunks Supported: 16 Maximum Simuttaneous Transmissions: 70 Advanced Features: User Programments V 56 Internation Programmable, X.25 Interface, Programmable, A.25 Invertace, Security, Diagnostics Advanced Attendant Features: X.25 Monitoring Advanced Station Features: Software Downline Loading, Billing Third-party Number installed to Date: More than 100 (See Vendor Profile Page V-23)

PROLINK CORP. PROLINK Equipment Type: PBX ion: Integrated Voice/

Data Switch Technology: Analog/Digital Switching Martrix: Space Divsion Modulation Method: PCM Maximum Trunks Supported: 128 Maximum Stations Supported: 128 Attendent Consoles (filladimum): 8 Martrix Architecture: Blocking Maximum Transmission Speeds:

Voice: 1,000,000 bit/sec

Data: 1.000.000 bit/sec Advanced Features: User Programmable, T-1 Carrier Interface, LAN Capability (Micro/Mini/ Mainframe), OA, Diagnostics, Data Security, Protocol Conversion ced Attendant Fe Advanced Attendant Peasures: Busy Lanp Field, Internal Directory Advanced Station Features: Personal Speed Code No., Call-Waiting Voice Button, Speaker

Purchase: \$500 to \$800 Distribution Method: OEM Number Installed to Date: 25 to 50 Date First Installed: 1982 (See Vendor Profile Page V-24)

ROCKWELL INTERNATIONAL CORP. GALAXY ACD Equipment Type: ACD Transmission: Integrated Voice/ Data Switch Technology: Digital Switching Metrix: Time/Space/Time Modulation Method: PCM Maximum Trunks Supported: 1,536 Maximum Stations Supported:

Attendant Consoles (Maximum): 512 Matrix Architecture: Nonblocking, 100%

Tranomissione: 768 Maximum Tranomis Voice: 9,600 bit/sec

Advanced Features: T-1 Carrier interface, X.25 Interface, OA. Diagnostics, Protocol Conversion Distribution Method: End user Number Installed to Date: More Date First Installed: April 1974 (See Vendor Profile Page V-25)

Data: 9,600 bit/s

CBX II (8000 CPU) Equipment Type: CBX Transmission: Integrated Voice/ Switch Technology: Digital Switching Matrix: Time Division Modulation Matrix: Time Division Maximum Trunks Supported: 4,000 Maximum Stations Supported: 10.000 ndant Consoles (Maximum): 6

strix Architecture: Nonblocking eximum Simultaneous ne: 11,520 Voice: 64,000 bit/sec

Data: 64,000 bit/sec Advanced Features: User
Programmable, Digitizes at Handset
(End-to-End Digital), T-1 Carrier
Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe). Voice Store and Forward, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion Advanced Attendent Features Attendent Directory, Telephone

Message, Management System, IBM Distribution Method: End user. or Installed to Date: More

than 100 Date First Installed: October 1983 (See Vendor Profile Page V-26)

CBX II (9000 CPU) Equipment Type: CBX Transmission: Integrate ion: Integrated Voice/

Switch Technology: Digital Switching Metrb: Time Division Modulation Method: PCM Maximum Trunks Supported: 4,000 Maximum Stations Supported: 10,000

Matrix Architecture: Nonbiocking Meximum Simultaneous Transmissions: 11,520 Maximum Trac

Voice: 64,000 bit/sec Data: 64,000 bit/sec Advanced Features: User
Programmable, Digitizes at Handeet
(End-to-End Digital), T-1 Carrier
Interface, X.25 Interface, LAN Capability (Micro/Mini/Main Voice Store and Forward, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol

Advanced Attendent Features: Attendent Directory, Telephone Message Management System Distribution Method: End user, Third-party Number Installed to Date: More

Date First Installed: October 1983

VSCBX ent Type: CBX eion: Integrated Voice/ Data

Data Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 40 Maximum Stations Supported: 144 Attendant Consoles (Maximum): 2 Maximum Simultaneous Maximum Trans

Voice: 64 000 bit/sec Data: 64,000 bit/sec Advanced Features: User Programmable, Digitizes at Handest (End-to-End Digital), T-1 Carrier

Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe). Voice Store and Forward, OA. Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion Attendent Directory, Telephone Message Menagement System Advanced Station Features: D Sheet Listing Distribution Method: End user Humber Installed to Date: More

than 100 Date First Installed: September

SIEMENS COMMUNICATIONS SYSTEMS

SATURN II **Equipment Type: PABX** elen: Integrated Voice/

Duta
Switch Technology: Digital
Switching Matrix: Time Division
Blockulation Method: PCM
Macalman Turnics Supported: 72
Macalman Sulfone Supported: 72
Altendent Concoles (Blocknaws): 4
Blastrix Architecture: Nonblocking, 100%

Transmissions: 224 Advenced Features: User Programmable, Digitizes at Handset (End-to-End Digital), OA, Diagnostics, Message Waiting Privacy

Advanced Station Features: Hold, Transfer, Conference Call, Queuing, Call Pick-up, Speed Calling, Station Hunting

Distribution Method: OEM, Thirder installed to Date: More

then 100 Date First Installed: September 1982

(See Vendor Profile Page V-26)

SIEMERS COMMUNICATIONS SYSTEM

Equipment Type: PABX mission: Integrated Voice/ Date

Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 224 Maximum Stations Supported: 364 Attendant Consoles (Maximum): 8

100% Transentesione: 884 Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), OA, Diagnostice, Message Waiting Privacy Advanced

Advanced Station Features: Hold, Transfer, Conference Call, Queuing, Call Pick-up, Speed Calling, Station Hunting Distribu ion Method: OEM, Third-

party ber Installed to Date: More than 100

Date First Installed: 1983

SIEMENS COMMUNICATIONS SYSTEMS

Equipment Type: PABX Transmission: Voice Switch Technology: Analog Switching Metrix: Space Division Modulation Method: Analog AD Maximum Trunks Supported: 48 Maximum Stellone Supported: 192 Attendent Consolee (Maximum): 2 Mehrix Architecture: Full Availability Maximum Simultaneous ne: 48

Data: 4,800 bit/sec Advanced Features: User Programmable, Diagnostics, Data Security Number Installed to Date: 8,000 Date First Installed: Sectember

SIEMENS COMMUNICATIONS SYSTEMS

**3D-192MX** 8D-1928K/ Equipment Type: PABX Transmission: Voice Switch Technology: Analog Switching Metric: Space Divsion Hazdraum Trunks Supported: 18 Mazdraum Stations Supported: 192 Attendent Consoles (Maximum): 2 Matrix Architecture: Ful Availability Maximum Struktures: 4 Transmissions: 48 Maximum Transmis ion Speeds:

Data: 4,800 bit/sec Advanced Feetures: User Programmable, Diagnostics, Data Security Parking, Trunk-to-Trunk Station

Distribution Method: Third-party Number Installed to Date: 8,000 Date First Installed: June 1980

SOLID STATE SYSTEMS, INC. CEO

**Equipment Type:** CBX ileaion: Nonintegrated Voice/

Switch Technology: Analog Switching Matrix: Space Divsion Maximum Trunks Supported: 384 Maximum Stations Supported: 1,792

Attendant Consoles (Maximum): 1 Metrix Architecture: Nonblocking, 90%

Transmissions: 512 Meximum Transmiss

Voice: 9,600 bit/sec Data: 9,600 bit/sec Advanced Features: User Programmable, T-1 Carrier Interface, LAN Capability (Micro/Mini/ Mainframe), OA, Security, Diagnostics, Data Security, Energy Control/Menagement, RJE to Host Interface, Protocol Conversion

Purchase: \$300 to \$750
Distribution Method: Third-party
Number Installed to Date: 25 to 50
Date First Installed: June 1981 (See Vendor Profile Page V-28)

SYSCOM, INC. STORE & FORWARD MESSAGE

Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Hazimum Trunks Supported: 32 Maximum Simultaneous Transmissions: 32 Maximum Transmi

Data: 9,600 bit/sec Advanced Features: User Programmable, LAN Capability (Mainframe), Security, Diagnostics,

Average Monthly Maintenance: \$1 Distribution Method: End user Number installed to Date: 25 to 50 Date First Installed: 1980 (See Vendor Profile Page V-29)

T-BAR, INC. 3690/3900 SERIES COMPUTER SWITCH MATRIX

SWITCH MATRIX Equipment Type: Data Switch Transentesion: Data Switch Technology: Analog Switching Matrix: Space Division Attendent Consoles (Maximum): ! Matrix Architecture: Nonblocking, 100%

Maximum Trac Data: 8,000,000 bit/sec Advanced Features: User Programmable, Security, Diagnostics Advanced Attendant Features: Real-Time Configuration, Display User Data Base Switching Advanced Attendant Feet Channel Interface, Diagnostic Module, Connectivity, Insensitivity to Power Loss

Prices: \$900 to \$1,100
Distribution Method: End user
Number Installed to Date: 1,700
Date First Installed: February 1975 (See Vendor Profile Page V-29)

T-BAR, INC.

5000 SERIES Equipment Type: Data Switch Transmission: Voice, Data, Nonintegrated Voice/Data, Nonintegrated voice/Data, Integrated Voice/Data Switch Technology: Analog Switching Matrits: Space Division Maximum Trunks Supported: 96 Attendant Consoles (Maximum): 1 Matrix Architecture: Nonblocking,

Transmissions: 96 Maximum Trans

Voice: 64,000 bit/sec Data: 2,040,000 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), Security, Diagnostics Advanced Attendant Features: Individual Line and Bulk Line Switch Advanced Station Features: Speed and Protocols, Transparency, Insensitivity to Power Loss

Purchase: \$100 to \$150 Distribution Method: End user, OEM, Third-party

Number Installed to Date: 100,000 Date First Installed: 1972

T-BAR, INC. 5900 SERIES PATCH Equipment Type: Analog Switch Trensmission: Voice, Data, Nonintegrated Voice/Data, Nonintegrated Voice/Data, Integrated Voice/Data Switch Technology: Analog Switching Matrix: Space Divsion Matrimum Trunits Supported: 96 Attendant Concoles (Maximum): 1 Matrix Architecture: Nonblocking, 100%

Maximum Simultan Transmissions: 96 Maximum Transmis

Voice: 64,000 bit/sec Data: 2.040.000 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, Diagnostics Advanced Attendent Features: Circuit Reconfiguration, Modern Subset and Sparing, Monitor and

\*ctivity Display, Connectivity, naenaltivity to Power Loss

Purchase: \$85 to \$150 istribution Method: End user, OEM, Third-party Number installed to Date: 100,000

T-BAR, INC.

MASS Equipment Type: Data Switch Transmission: Voice, Data, Nonintegrated Voice/Data, Integrated Voice/Data Switch Technology: Analog Switching Metrix: Direct Maximum Trunke Supported: 8,192 Attendent Consoles (Maximum): 8 Metrix Architecture: Nonblocking, 100%

Maximum Simultaneo Transmissions: 8,192 Maximum Transmissio Data: 2,040,000 hit/sec Advanced Features: User Programmable, T-1 Carrier Interface, X.25 Interface, Security, Diagnostics Advanced Attendant Featur Central Distribution, Control Preprogrammed Configuration, Automatic Alarms **Advanced Station Feature** Transparency to Protocol and Data Rate

Purchase: \$350 to \$500 Distribution Method: End user, OEM Number Installed to Date: More Date First Installed: March 1980

VIRTUAL SWITCH MATRIX Transmission: Data Switch
Transmission: Data Switch
Transmission: Data
Switch Technology: Digital
Switching Matrix: Space Divsion
Maximum Trunks Supported: 4,096
Matrix Architecture: Nonblocking,

Transmissions: 4,096

aximum Transmission Speeds: Data: 230,000 bit/sec Advanced Features: User Programmable, Security, Diagnostics, RJE to Host Interface, Protocol Transparency Advanced Attendant Feature Central Distribution, Control Preprogrammed Configuration, Automatic Alarms, Network Management, Data Base

Distribution Method: End user, OEM Number installed to Date: More Date First Installed: January 1982

TECHTRAN INDUSTRIES, INC. MC 56 56T Equipment Type: IBX mission: Integrated Voice/

Switch Technology: Analog Matrix Architecture: Nonblocking, 100%

laximum Transmission Sp Data: 5,000,000 bit/sec nced Features: Use Programmable Distribution Method: End user Date First Installed: September (See Vendor Profile Page V-29)

TEKNEKROM INFO SWITCH INFO SWITCH ACD Equipment Type: ACD Transmission: Nonintegrated Voice/

Switch Technology: Analog Switching Matrix: Space Divsion Maximum Trunks Supported: 800 Maximum Stations Supported: 700 100%

laximum Simi Transmissions: 880 Maximum Transmission Speeds: Vinice: 9 600 hit/eac

Advanced Features: User Advanced Features: User Programmable, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), OA, Diagnostics Distribution Method: End user Number Installed to Date: More than 100 (See Vendor Profile Page V-30)

TELECOM TECHNOLOGIES ECD 1000

ECD 1000
Equipment Type: ACD
Transmission: Voice
Switch Technology: Analog
Switching Martin: Space Division
Maximum Trunks Supported: 20
Metrix Architecture: Nonblocking, 100%

Transmissions: 20 Advanced Features: User Programmable, RJE to Host Programmable, NJC to Host Interface, 8 Agent Groups Distribution Method: Third-party Number Installed to Date: 10 to 25 Date First Installed: September 1983

(See Vendor Profile Page V-30)

TELECOM TECHNOLOGIES

ECD 2000 Equipment Type: ACD Equipment Type: ACD Tranemission: Voice Switch Technology: Analog Switching Martrix: Space Divsion Maximum Trunks Supported: 48 Maximum Stations Supported: 48 Martrix Architecture: Nonblocking, 100%

Maximum Simultan Transmissions: 48 Advanced Features: User Programmable, Diagnostics, RJE to Host Interface Distribution Method: Third-party Number Installed to Date: More then 100 Date First Installed: November 1982

TELE/RESOURCES T R 150 SERIES F H 150 SERIES
Equipment Type: PBX
Transmission: Voice, Data
Switch Technology: Analog
Switching Matrix: Time Division
Modulation Method: PAM Maximum Trunks Supported: 64
Maximum Statione Supported: 256
Attendent Consoles (Maximum): 2
Matrix Architecture: Blocking Transmissions: 64 Maximum Transm Voice: 4,800 bit/sec

Data: 4,800 bit/sec Advanced Features: User Programmable, Diagnostics, Data Security, Four-Wire Transmission

Purchase: \$300 Distribution Method: Third-party Number Installed to Date: More Date First installed: 1979 (See Vendor Profile Page V-30)

331 XPI EXER 331 XPLEXER
Equipment Type: Packet Processor
Transmission: Data
Switch Technology: Digital
Switching Martin: STDM
Maximum Trunks Supported: 18
Maximum Stations Supported: 32
Maximum Transmission Speeds: Data: 76 800 bit/sec

and Parity Conversion Advanced Attendent Features: Configuration Status, TICS Messages **Advanced Station Features** Autoband, Echopiex, Host Select Message, Broadcast, Port Contention, Queuing Option

Advanced Features: Security, Diagnostics, Data Security, Speed

Purchase: \$2,900 to \$12,900 Distribution Method: End user, OEM, Third-party Number Installed to Date: 25 to 50 Date First Installed: 1983 (See Vendor Profile Page V-30)

TERMINAL DATA CORP. DATA SWITCH Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Trunka Supported: 1 Maximum Stationa Supported: 4 Attendant Consoles (Maximum): 1 Matrix Architecture: Blocking Maximum Transı Data: 19,200 bit/sec

Purchase: \$129 to \$300 Average Monthly Maintenance: Distribution Method: End user Number Installed to Date: More enance: \$10 than 100 Date First Installed: May 1982 (See Vendor Profile Page V-30)

THE COMMUNICATIONS, INC. MERCURY PRY MERCURY PBX Equipment Type: PABX Transmission: Voice Switch Technology: Digital Switching Method: PCM Maximum Trunks Supported: 480 Maximum Stations Supported:

1 920 Attendant Consoles (Maximum): 8 Matrix Architecture: Blocking Maximum Simultaneous Transmissions: 255 Advanced Features: Diagnostics,

Price:
Purchase: \$300 to \$400
Distribution Method: Third-party
Number Installed to Date: 50 to 100
(See Vendor Profile Page V-31)

PERCEPTION

Equipment Type: PABX Transmission: Voice Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 32 Maximum Stations Supported: 120 Attendant Consoles (Maximum): 2 Matrix Architecture: Nonblocking, 100% Maximum Simi

Transmissions: 120 Maximum Trans mission Speeds: Voice: 20,000 bit/sec Voice: 20,000 bit/sec Advanced Feetures: User Programmable, LAN Capability (Micro/Mini/Mainframe), Diagnostics Distribution Method: Third-party Date First Installed: March 1983 (See Vendor Profile Page V-31)

TECHNOLOGIES/LEXAR

UTX 1001 Equipment Type: PBX Transmission: Integrated Voice/ Data

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: ADM Maximum Trunks Supported: 3,000 Maximum Stations Supported:

Attendant Consoles (Maximum): 16 Matrix Architecture: Nonblocking, 100% nissions: 512

Voice: 56,000 bit/sec

Data: 64,000 bit/sec Advanced Features: Digitizes at Handset (End-to-End Digital), LAN Capability (Micro/Mini/Mainframe), Voice Store and Forward, OA, Diagnostics, Energy Control/Management, Protocol Conversion
Distribution Method: End user
Number installed to Date: 50 to 100
Date First Installed: January 1981
(See Vendor Profile Page V-32)

TECHNOLOGIES/LEXAR UTX 1200

Equipment Type: PBX salon: Integrated Voice/

Data
Switch Technology: Digital
Switching Matrix: Time Division
Modulation Method: PCM
Maximum Trunks Supported: 1,200
Maximum Statione Supported: 1,344

Attendant Consoles (Maximum): 12 Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 672 Maximum Trans

Voice: 64,000 bit/sec Data: 9,600 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, Security, Diagnostics, Data Security

Purchase: \$650 Distribution Method: End user Humber Installed to Date: More

UNITED TECHNOLOGIES/LEXAR

UTX 5000 Equipment Type: PBX Transmission: Integrated Voice/ Data

Switch Technology: Digital Switching Matrix: Time Division Modulation Method: PCM Maximum Trunks Supported: 5,378 5.376

Attendant Consoles (Maximum): 48 Matrix Architecture: Nonblocking Maximum Simultaneous Transmissions: 2,688 Maximum Transmiss

Voice: 64,000 bit/sec Data: 9,600 bit/sec Advanced Features: T-1 Carrier Interface, X.25 Interface, Security Access Control, Diagnostics, Data Security

Purchase: \$650 Distribution Method: End user Number Installed to Date: More

WESTERN DATACOM UNISWITCH 1020 Equipment Type: Data Switch Transmission: Data Switch Technology: Digital

Switching Metriz: Physical Switch Maximum Trunks Supported: 8 Maximum Stations Supported: 8 Metrix Architecture: Nonblocking, 100%

Transmissions: 4 Maximum Trans lasion Speeds:

Data: 19,200 bit/sec Advanced Feetures: User
Programmable, LAN Capability
(Micro/Mini), OA, Security,
Diagnostics, Data Security, RJE to Host Interface

Purchase: \$875 Average Monthly Maintenance: \$5 Distribution Method: Third-party Humber Installed to Date: 50 to 100 Date First Installed: Soptember 1982 (See Vendor Profile Page V-33)

WESTERN TELEMATIC, INC. Assa Equipment Type: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 2 Price: ABS

Purchase: \$89 Distribution Method: End user, OEM, Third-party Number Installed to Date: More then 100 Date First Installed: 1982 (See Vendor Profile Page V-33)

WESTERN TELEMATIC, INC. CAS 41

CAS 41
Equipment Type: Data Switch
Transmission: Data
Switch Technology: Digital
Maximum Stations Supported: 4
Distribution Method: End user, OEM, Third-party Number Installed to Date: More than 100 Date First Installed: 1982

WESTERN TELEMATIC, INC. CAS 164 CAS 164
Equipment Type: Data Switch
Transmission: Data
Switch Technology: Digital
Maximum Stations Supported: 64

Price: Purchase: \$795 Distribution Method: End user, OEM, Third-party Number Installed to Date: More than 100

Date First installed: 1982

WESTERN TELEMATIC, INC. PSU 41 PSU 41
Equipment Type: Data Switch
Transmission: Data
Switch Technology: Digital
Maximum Stations Supported: 4

Purchase: \$395 Distribution Method: End user, OEM, Third-party ed to Dete: More then 100 Date First Installed: 1982

WESTERN TELEMATIC, INC.

Transmission: Data Switch Transmission: Data Switch Technology: Digital Maximum Stations Supported: 4

Purchase: \$295 Distribution Method: End user, OEM, Third-party Number Installed to Date: More than 100

XYPLEX, INC. XYPLEX SYSTEM XYPLEX SYSTEM Equipment Type: Packet Processor Transmission: Data Switch Technology: Digital Switching Metrix: STDM Modulation Method: FM Maximum Stations Supported: 2,000

2.000 Metrix Architecture: Nonblocking, 100%

Transmissions: 2,000 Maximum Transmission Data: 9,600 bit/sec

Advanced Features: User Programmable, LAN Capability (Micro/Mini/Mainframe), OA, Security, Diagnostics, Protocol

Purchase: \$350 Distribution Method: OEM, Third-

Date First Installed: October 1982 (See Vendor Profile Page V-33)

ZTEL, INC. PNX Equipment Type: PABX Transmission: Integrated Voice/

Data
Switch Technology: Digital
Switching Matrix: Time Division
Modulation Method: PCM
Maximum Stations Supported:

Matrix Architecture: Nonbiocking Maximum Transmission Speeds: Voice: 64,000 bit/sec

Deta: 56,000 bit/sec Advanced Features: User Programmable, Digitizes at Handset (End-to-End Digital), T-1 Carrier Interface, X.25 Interface, LAN Capability (Micro/Mini/Mainframe), Voice Store and Forward, OA, Security, Diagnostics, Data Security, RJE to Host Interface, Protocol Conversion, IEEE 802.5 Interface

Price: Purchase: \$800 to \$1,000 Distribution Method: Third-party Date First Installed: June 1984 (See Vendor Profile Page V-34)

ACCES XNS is ACC's networking protocol package ready for use on popular minicomputers and work stations. It links applications and system level programs to data files and processing services in your distributed computer environment...through simple Remote Procedure Calls.
The ACCES XNS Protocol Package adheres to Xerox protocol standards:

Courier, SPP, and IDP-making it compatible with other standard products, present and future.

Whether you are responsible for designing a communication environment around your company's product line, or interconnecting your company's computer resources, ACCES XNS meets your network design requirements.

To learn more about ACCES XNS, Courier, and Remote Procedure Calls, phone ACC at (805) 963-9431 and we'll gladly send you the ACCES XNS Brochure.

We Make Advanced Computers Communicate.



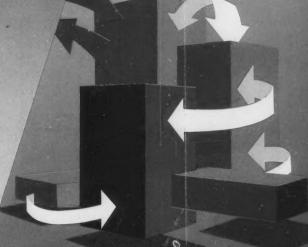
R. GET\_FILE, TRUE, TIMEOUT); (STRING,"backup\_file");

(& Trnld) = = RETURN

NGCARD, & FileSize ); 6.8Count! =  $C_EOM$ 

outfd, buffer, 512);

tfd,buffer,Count);



**Network Designers**— Introducing the simplicity of a Remote Procedure Call ... ACCES XNS.

ACCES XNS is ACC's networking protocol package ready for use on popular minicomputers and work stations. It links applications and system level programs to data files and processing services in your distributed computer environment...through simple Remote Procedure Calls.

The ACCES XNS Protocol Package adheres to Xerox protocol standards: Courier, SPP, and IDP-making it compatible with other standard products,

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We Male Advenced Computers Communicate.



GET\_FILE, TRUE, TIMEOUT); CSTRING, "backup\_file" (& Trold) = = RETURN CARD, & FileSize );  $6.8Count)! = C_EOM)$ outfd, buffer, 512); itfd, buffer, Count );

# Index to Local-Area Networks by Topology

A local-area network is a communications network that permits the interconnection of data communications devices within a limited distance. The local network shares a common medium, has high-speed broadcasting ability and is generally shared by all users. In addition, the network must support distributed processing, file transfer, data base management and access to long-haul networks. The index has been sorted by network topology — bus (linear or tree), star or ring. The final section of the index includes all networks which utilize other topologies or have unspecified topologies. Within each section, products are listed alphabetically by vendor and contain information on transmission technique, price and the page on which the complete listing can be found.

### Bus (Linear) Networks

VENDOR	MODEL	TECHNIQUE	PRICE	PAGE
Alspa Computer, Inc	ALSPA NET	Baseband	\$1,500	04
AST Research, Inc.	AST PCNET	Baseband	\$695	C4
Braegen	8500 LOCAL CONTROLLER (ELAN SYSTEM)	Broadband	\$19,495 to \$29,495	C-1
Bumbleboe Energy Systems	BUMBLEBEE NETWORK	Basebend	\$100 to \$150	C-1
Codex Corp.	4000 SERIES LAN	Baseband	N/A	C-1
Commtex, Inc.	MDS 8070 NETWORKING OPTION	Baseband		04
Complex Systems, Inc.	X LAN	Baseband	\$292	C-1
	OMEGANET			C-1
Computer Automation, Inc	SYFANET	Broadband	N/A	C-
Computrol	MEGA LINK	Baseband	\$100 to \$3,000	C-
Convergent Technologies, Inc.	CT-CLUSTER	Baseband		C-1
Corvus Systems, Inc.	OMNINET	Baseband	\$495 to \$1.500	C-1
CYB Systems, Inc.	UNITE	Baseband		C-I
Data General Corp	XODIAC/NETWORK BUS SYSTEM/4460	Baseband	N/A	C-I
DCA/TAC	DCA INA/NETWORK	nedband/Baseband	N/A	C-
Delta Systems, Inc.	WHITE BOX I	Broadband	\$1.500	6
	DESNET			
Digital Equipment Corp				C
Gateway Communications, Inc.	G/NET	Basebend	\$595	0
Harris Corp			\$1,250	C-
	HARRIS 9070 (BROADBAND)	Broadband	\$1,250	C-
IDE Associates, inc		Baseband	N/A	C
Interior, Inc.				C
Inter-Link				C-
Interall Systems, Inc	GE NET	Broadband	\$800 to \$1,000	C
JC Systems	JCS A-10	Broadband	\$495	C
Metapath, Inc.	ROBIN DESKTOP DATA SWITCH	Baseband	\$400	C
NBI, Inc	NBI NET	Baseband		C
	NCR DECISION NET			C
	HYPER CHANNEL			
Novell Inc.				C-1
Omnidata				
	TIENET	Rasehend		
	RAYNET IV			
	STANDARD NET			C-1
Tecmar, Inc.			\$1.695 to \$3.395	
	NET/ONE BASEBAND NETWORK INTERFACE UNIT.			
	ETHERNET			
Xypiax Inc.				

# **Bus (Tree) Networks**

VENDOR	MODEL	TECHNIQUE	PRIC	E	PAGE
Able Computer	EASYWAY/E ETHERNET CONTROLLER	. Basebend	\$7.20	00	C-4
Applitok Corp.	UNILAN FIBER OPTIC	Fiber Optics	N	/A	C-4
	UNILAN I	. Baseband	N	/A	C-4
	UNILAN II	Broadband	N	/A	C-4
<b>BBN</b> Communications Corp	BBNCC X.25 PACKET SWITCHING NET	Packet	N	/A	C-4
Concord Data Systems, Inc	TOKEN/NET	Broadband	\$500 to \$1,00	00	C-5

# **Local-Area Network Index**

VENDOR	MODEL	TECHNIQUE	PRICE	PAG
Contel Information Systems	CONTEL NET	Baseband/Broadband	\$300 to \$500	0
CR Computer Systems	X-NET	Baseband	\$1,000	C
Datapoint Corp	ARC			C
Gould, Inc	MODWAY	Baseband/Broadband	\$1,500	C
Ideas, Inc.	INET	Broadband	\$500	C
Interactive Systems/3M	VIDEODATA LAN/1		\$400 to \$600	C
Modular Computer Systems, Inc	MAX NET		\$3,500 to \$30,000	C
NCR Corp.	MIRLAN (MID RANGE LAN)			0
Network System Corp	HYPER BUS		\$8.000	C-1
PERQ Systems	ETHERNET	Broadband	N/A	0-1
Syntrex, Inc.	SYNNET	Baseband		01
Sytek, Inc.	LOCAL NET	Broadband	\$345 to \$545	C-1
Ungermann-Bass, Inc.	NET/ONE BROADBAND NETWORK INTERFACE I	JNIT Broadband		C-1
	SERIES 600 PRODUCTS	Broadband		C-1
Western Telemetic, Inc.	SS-8		\$895	
3 Com Corp.	ETHERSERIES		\$950	C-1

# Star Networks

VENDOR	MODEL	TECHNIQUE	PRICE	 PAGE
Aetna Telecomm Labs	ATL NET	. Baseband	N/A	 C-4
American Photonics, Inc	64 NET	Fiber Optics		 C-4
Betacom Corp	PROF COMMUNICATIONS MANAGER 2000	. Baseband	\$1,300 to \$2,500	 C-5
Godenoll Technology Corp	CODENET	. Baseband	\$150 to \$900	 C-5
Computer Comm. Specialists, Inc	TASK 1000	. Baseband	N/A	 C-5
CPT Corp.	OFFICE DIALOGUE	. Baseband	\$30,000 to \$42,000	 C-6
Cygnet Technologies, Inc.	COSYSTEM	Broadband	\$1,495 to \$1,845	 C-6
Digital Microsystems, Inc.	HINET	. Baseband		 C-7
Gendalf Data Inc.	PACXNET	. Baseband	\$500 to \$135	 C-7
IDE Associates, Inc	IDEASHARE/SPR-IS	RS232		 C-8
InteCom Inc	LANMARK	. Baseband	\$500 to \$600	 C-8
Miloom Systems, Inc.	INSTANET	TDM	\$100 to \$250	 C-9
Nester Systems, Inc.	PLAN SERIES	. Baseband	\$2,000 to \$100,000	 C-9
Novell Inc.	NETWARE-S	. Baseband	\$250	 C-10
Peripheral Technology, Inc.	SNC	. Baseband	\$600	 C-10
Proteon Associates, Inc.	PRONET Baseban	d/Broadband	\$600 to \$2,800	 C-11
Steam Computer Systems Corp	MICRONETWORK	. Baseband	\$4,000 to \$6,000	 C-11
Teltone Corp.	DCS-2	Broadband	\$450	 C-12
Trentor Systems Ltd		Broadband	N/A	 C-12
Ungermann-Bass, Inc.			N/A	 C-12

# Ring Networks

VENDOR	MODEL.	TECHNIQUE	PRICE	 PAGE
Daromo, Inc.	CONVENER-NETWORK CONFERENCING UNIT	Baseband	\$550 to \$1,700	 C-6
	CONVENER-PHONE CONFERENCING UNIT	. Baseband	\$550 to \$1,700	 C-6
	DAROME 2020 COCONVENER	. Baseband		 C-6
Daveng Systems, Inc				
Fujitsu America, Inc	OPTICAL DATA HIGHWAY	Fiber Optics		 C-7
Logica, Inc.	POLYNET	. Baseband	\$1,400 to \$4,900	 C-9
Northern Telecom, Inc.	NORTHERN TELECOM, INC	. Baseband	\$1,600 to \$1,600	 C-10
Percom Data Corp	PERCOM NET	. Baseband	\$595 to \$1,700	 C-10
Phoenix Digital Corp	OPTONET	. Baseband	\$100,000	 C-10
Prime Computer, Inc	RINGNET	. Baseband	\$5,000	 C-11
Prolink Corp	PROLOOP NETWORK	. Baseband		 C-11
	PLANET		\$600 to \$900	 C-11
Stratus Computer, Inc.	. STRATALINK	. Baseband		 C-11
	WINNET		\$100	 C-12
Ztel, Inc.	ZTEL LAN	. Baseband		 C-13

# **Networks Using Other Topologies**

VENDOR	MODEL	TECHNIQUE	PRICE	PAGE
American Laser Systems, Inc.	736/NOVA-SR OPTICAL DATA/VOICE	Digital	\$7,000 to \$13,000	C4
	MODEL 761 VIDEO TRANSMISSION	. Baseband	\$7,750	C-4
	MODEL 829 WIDEBAND DIGITAL INFRARED			
Artsi Communications Corp	CV100 CAD/CAM SYSTEM	. Baseband	N/A	C-4

# **Local-Area Network Index**

VENDOR	MODEL	TECHNIQUE	PRICE	PAG	涯
Artel Communications Corp	LS100 INTERFACE MODEM				
	T2010/K2010 HIGH-SPEED DATA TRANS	Baseband		C	-4
	TR2016/TR2017 RGB VIDEO/DATA	Baseband		C	54
Auscom, Inc	8911A CHANNEL INTERFACE	IBM TO LAN	N/A	0	-4
Backus Data Systems, Inc	SIX PORT SWITCHING SYSTEMS			C	-4
Databit, Inc.	ANP 2520 (ADVANCED NETWORK PROCESSOR)	Packet		C	-8
	EDX-P	Packet		0	-8
Datastream Communication, Inc	774	Baseband	\$4,000 to \$10,000	C	27
	776	Baseband	\$4,000 to \$6,000	C	27
	874	Baseband	\$16,000	C	27
	MPC	Baseband	\$6,000 to \$12,000	0	27
General Electric Co	GEMLINK LDS-072A			C	28
	GEMLINK LSD-112A/122A	Microwave	N/A	C	28
	LSD-092A	Microwave	N/A	C	28
	GEMLINK LDS-082A	Microwave		C	28
Infolink	SYSTEM 5000	Baseband	\$2,000 to \$4,000	C	3.8
ITT Telecom Products, inc	MULTITENENT	Baseband		C	2.9
Lynch Communication Systems	VOICE PLUS DATA SUBSCRIBER CARRIER	FSK	\$203 to \$256	C	2.8
	LOCAL MUX			C	
Orchid Technology, Inc	PC NET	Baseband		C	10
Scientific Data Systems, inc	SDS NETWORK	Broadband	\$5,000 to \$6,000	0	11
Tandem Computers, Inc					
	NONSTOP TXP	Fiber Optic			
	NONSTOP 1				

# Local-Area Networks

ABLE COMPUTER EASYWAY/E ETHERNET CONTROLLER Topology: Bus (tree) Network Type: Baseband Maximum Physical Conne 1,024 Maximum Distance: 9,240 Feet Transmission Media: Terrestrial

Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: IEEE 802.3 Network Compatibility: DEC DNA/Decnet, IEEE 802.3, NBS4 Intel

Advanced Functions: Diagnostics, Usage/Traffic Reporting Bhile Purchase: \$7,200 Distribution Method: End user Date First Installed: September

1983 (See Vendor Profile Page V-1)

AETHA TELECOMM LABS ATL NET

Topology: Star Network Type: Baseband Maximum Physical Connections: 19 Tran Riber Optics
Access Method: Round Robin
Protocols Supported:
Asynchronous, Synchronous, X.25,
Bisynchronous, T-1, SDLC, HDLC, Ascii

Network Competibility: DEC DNA/Decnet, IBM BSC, Telenet, DDS, Tymnet rted: RS 232C, RS 422/423, RS 449, CCITT

(See Vendor Profile Page V-1) ALSPA COMPUTER, INC. ALSPA NET

Topology: Bus (Linear) Network Type: Baseband Muximum Physical Conn

Mazimum Distance: 2,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: CSMA/CD (Contention Type) Protocols Supported: Asynchronous, SDLC, HDLC, Ascii Network Compatibility: Telenet Interfaces Supported: RS 232C, RS Advanced Functions: Diagnostics, Usage/Traffic Reporting Price:

Purchase: \$1,500 Distribution Method: Third-party Number Installed to Date: Over 100 Date First Installed: April 1983 (See Vendor Profile Page V-1)

AMERICAN LASER SYSTEMS, 738 & NOVA-SR INFRARED OFFICAL DATA/VOICE BYSTEM Topology: Point to Point Network Type: Digital Maximum Distance: 10 Miles Transmission Media: Free Space Infrared Light, Laser

Protocols Supported: Asynchronous, Synchronous, Bisynchronous faces Supported: RS 232C, TTL Input

Lease: \$1,300 Purchase: \$7,000 to \$13,000 Distribution Method: End user Number Installed to Date: 231 Date First installed: 1974 (See Vendor Profile Page V-2)

AMERICAN LASER SYSTEMS. MODEL 761 VIDEO TRANSMISSION SYSTEM Network Type: Baseband Maximum Physical Connections: Transmission Media: Free Space

Infrared Light Price: Lease: \$775

Purchase: \$7,750 Average Monthly Maintenance Distribution Method: End user Number Installed to Date: 210 Date First Installed: 1975

AMERICAN LASER SYSTEMS. MODEL 829 WIDERAND DIGITAL

INFRARED TRANSMISSION SYSTEM Topology: Point to Point Network Type: Baseband Maximum Physical Connection Maximum Distance: 7,500 Feet Transmission Media: Free Space Infrared Light, Laser Protocols Supported: T-1 Interfaces Supported: TI OR TTL Advanced Functions: Security/Encryption

Purchase: \$14,000
Distribution Method: End user
Number Installed to Date: 1 to 10 Date First Installed: 1983

AMERICAN PHOTONICS, INC. **64 NET** 

Topology: Star Network Type: Fiber Optic Maximum Physical Connection Maximum Distance: 1,000 Feet Transmission Media: Terrestrial Fiber Optics, Free Space Laser Protocols Supported: Asynchronous Interfaces Supported: RS-232C, IEEE 488 Number installed to Date: 1 to 10 Date First installed: November 1983 (See Vendor Profile Page V-2)

APPLITEK CORP. UNILAN FIBER OPTIC Topology: Bus (tree) Network Type: Fiber Optic Maximum Physical Connecti 1,000

Mazimum Distance: 30 Miles Transmission Media: Terrestrial Coaxial Cable, Fiber Optics Access Method: Distributed CSMA/CD (Contention Type), Token Passing (Polling Types)

Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, HDLC, Ascii Interfaces Supported: RS-232C, IEEE 488, RS-449, V.35 Advanced Functions: Security/Encryption Distribution Method: End user (See Vendor Profile Page V-2)

APPLITEK CORP. UNILAN I Topology: Bus (tree) Network Type: Baseband Maximum Physical Connection Maximum Distance: 2 Miles Transmission Media: Terrestrial Coaxial Cable, Fiber Optics Access Method: Distributed CSMA/CD (Contention Type), Token

Passing (Polling Types) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, HDLC, Ascii Interfaces Supported: RS-232C, IEEE 488, RS-449, V.3.5 Advanced Functions: Security/Encryption, Diagnostics Distribution Method: End user

APPLITEK CORP. UNILAN II

Topology: Bus (tree) Network Type: Broadband Maximum Physical Connections: 40.000 Maximum Distance: 30 Miles Transmission Media: Terrestrial Coaxial Cable, Fiber Optics Access Method: Distributed CSMA/CD (Contention Type), Token Passing (Polling Types) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, HDLC, Ascii Interfaces Supported: RS-232C, IEEE 488, RS-449, V.35

ARTEL COMMUNICATIONS

CORP. CV100 CAD/CAM SYSTEM Topology: End to End Network Type: Baseband Maximum Distance: 2 Miles Protocols Supported: Asynchronous, Synchronous Network Compatibility: Computervision ibution Method: End user (See Vendor Profile Page V-3)

ARTEL COMMUNICATIONS LS100 INTERFACE MODEM Topology: End to End Network Type: Baseband Maximum Distance: 16,400 Feet Transmission Media: Terrestrial

Fiber Optics Network Compatibility: IBM 3250 Compatible Distribution Method: End user

ARTEL COMMUNICATIONS

T2010/K2010 HIGH SPEED DATA

Topology: End to End Natwork Type; Baseband Maximum Distance: 2 Miles Transmission Media: Terrestrial Fiber Optics Protocols Supported: Asynchronous Interfaces Supported: RS-232C, TTL/ECL Distribution Method: End user

ARTEL COMMUNICATIONS

CORP. TR2016/TR2017 RGB VIDEO & DATA MODULES Topology: End to End Network Type: Baseband
Maximum Distance: 10,000 Feel
Protocols Supported: Asynchronous
Interfaces Supported: RS-232C, TTL

Distribution Method: Fnd user

AST RESEARCH, INC. AST PCNET Topology: Bus (Linear) Network Type: Baseband hysical Connections Maximum Distance: 7.000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Bisynchronous Network Competibility: IBM BSC Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting

Purchase: \$695 Date First Installed: May 1983 (See Vendor Profile Page V-3)

AUSCOM, INC. 8911A PROGRAMMABLE CHANNEL INTERFACE Network Type: IBM to LAN (See Vendor Profile Page V-3)

BACKUS DATA SYSTEMS.

SIX PORT SWITCHING SYSTEMS Protocols Supported: Asynchronous, Synchronous, Ascii Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Usage/Traffic Reporting
Distribution Method: End user
Number Installed to Date: 50 to 100
(See Vendor Profile Page V-3)

BBN COMMUNICATIONS

CORP BBNCC X.25 PACKET SWITCHING NETWORK Topology: Bus (tree), Star, Ring, Arbitrary Mesh Network Type: Packet-Switched Meximum Physical Connections: Transmission Media: Terrestrial Twisted Wire, Free Space Microwaves and Sat Access Method: X.25, X.28 Protocols Supported: Asynchronous, Synchronous, X.25,

Bisynchronous, SDLC, HDLC, Ascii,

X.3. X.28. X.29 Network Competibility: IBM SNA, DEC DNA/Decnet, IBM BSC, Honeywell DSE/DSA, Burroughs BNA, Primenet, HP DSN, Telenet, DDS, Tymnet, X.25 Packet SVS Interfaces Supported: RS-232C, RS-422/423, MIL 188C, RS-449, CCITT, V.28, V.24 Security/Encryption, Diagnostics, Performance Analysis, Accounting and Billing, Downline Loading Average Monthly Maintenance: \$1 Distribution Method: End user, OEM Number Installed to Date: 10 to 25 Date First Installed: January 1969 (See Vendor Profile Page V-4)

BETACOM CORP. PROF COMMUNICATIONS MANAGER 2000 Topology: Star Network Type: Baseband Transmission Media: Free Space Laser, PBX to Satelite Access Method: Centralized PBX (Switching Type) Asynchronous, Synchronous, Bisynchronous, SDLC, Ascil, Baudot, TWX, Telex Network Compatibility: IBM SNA, IBM BSC, Telenet, Tymnet, TWX Interfaces Supported: RS-232C Advanced Functions: Diagnostics, Usage/Traffic Reporting

Purchase: \$1,300 to \$2,500 Average Monthly Maintenance: \$13 Distribution Method: End user Number Installed to Date: Over 100 (See Vandor Profile Page V-4)

BRAEGEN CORP. 8500 LOCAL CONTROLLER (ELAN Topology: Bus (Linear) Network Type: Broadband Maximum Physical Connections: Transmission Media: Terrestrial Coaxial Cable
Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Bisynchronous, SDLC, SNA SDLC Network Compatibility: IBM SNA, IBM BSC

interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Screen Format Selectable Lease: \$525 to \$725

Lease: \$525 to \$725 Purchase: \$19,495 to \$29,495 Average Monthly Maintenance: \$85 Distribution Method: End user Number Installed to Date: 10 to 25 Date First Installed: 1983 (See Vendor Profile Page V-4)

BUMBLEBEE ENERGY **SYSTEMS** BUMBLEBEE NETWORK Topology: Bus (Linear) Network Type: Baseband um Physical Connection

Maximum Distance: 4 Miles Transmission Media: Terrestrial Twisted Wire Twisted vivre
Accese Method: Centralized
Master/Slave Polling
Protocole Supported: Asynchronous
Interfaces Supported: RS-232C
Advanced Functione: Diagnostics

Purchase: \$100 to \$150 Average Monthly Maintenance: \$10 Distribution Method: End user Number Installed to Date: 10 to 25 Date First Installed: June 1981

CODENOLL TECHNOLOGY CORP. Topology: Star Network Type: Baseband Maximum Physical Connections: 1.024 Maximum Distance: 4 Miles Transmission Media: Fiber Optics Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Transparent Network Compatibility: IBM SNA, DEC DNA/Decnet, Primenet, Omninet, Tymnet Interfaces Supported: IEEE 488, Ethernet Advanced Functions: Security/Encryption, Performance Purchase: \$150 to \$900 Distribution Method: End user Number installed to Date: 25 to 50 Date First Installed: June 1981

(See Vendor Profile Page V-5) CODEX CORP. 4000 SERIES LAN Topology: Bus (Linear) Network Type: Baseband Transmission Media: Terrestrial Coaxial Cable , Fiber Optics Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, HDLC, Ascii Network Compatibility: IBM SNA, IBM BSC, Honeywell DSE/DSA, Burroughs BNA, Sperry DCA, XNS (Xerox), HP DSN Interfaces Supported: RS-232C, IEEE 488, RS-422/423, RS-449 Advanced Functions: Diagnostics, Usage/Traffic Reporting Distribution Method: End user Date First Installed: January 1984 (See Vendor Profile Page V-5)

MDS 8070 NETWORKING OPTION Topology: Bus (Linear and Tree), Network Type: Baseband Maximum Physical Connections: Maximum Distance: 20,000 Feet Transmission Media: Terrestrial Coaxial Cable
Access Method: Distributed Token Passing (Polling Types)
Protocols Supported:

Asynchronous, Bisynchronous, SDLC, Ascil, 3270 Network Compatibil IBM BSC Interfaces Supported: RS-232C, RS-422/423, MIL 188C, 20 mA Security/Encryption, Diagnostics Distribution Method: Third-party (See Vendor Profile Page V-6)

COMPLEX SYSTEMS, INC. Topology: Bus (Linear) Network Type: Baseband Maximum Physical Conne Maximum Distance: 10,000 Feet Transmission Media: Terrestrial Twisted Wire es Method: Distributed CSMA/CD (Contention Type) Protocole Supported: Asynchronous, Ascii Interfaces Supported: RS-232C Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting

Purchase: \$292 Distribution Method: Third-party Date First Installed: November 1983 (See Vendor Profile Page V-8)

OMEGANET

Topology: Bus (Linear) Network Type: Baseband Maximum Physical Conne Maximum Distance: 5,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: CSMA/CA Protocola Supported: Asynchronous Network Compatibility: Proprietary Interfaces Supported: RS-232C, RS-422/423 Advanced Function Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Distribution Method: Third-party Number Installed to Date: Over 100 Date First Installed: February 1982 (See Vendor Profile Page V-6)

COMPUTER AUTOMATION, INC. SYFANET

Topology: Bus (Linear)
Network Type: Broadband
Maximum Physical Connections: 64
Maximum Distance: 5,000 Feet
Transmission Media: Terrestrial
Coexial Cable
Access Method: Broadcast
Protocols Supported: X.25,
Bisynchronous, SNA work Compatibility: IBM SNA, IBM BSC IBM BSC Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting Distribution Method: End user,

Third-party

Number Installed to Date: 1 to 10 Date First Installed: 1983 (See Vendor Profile Page V-6)

COMPUTER COMMUNICATIONS SPECIALISTS, INC.

TASK 1000 Topology: Star Network Type: Baseband Maximum Physical Connections: Maximum Distance: 8,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Interupt Protocols Supported: Ansi Interfaces Supported: RS-232C, Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting
Distribution Method: End user
Number Installed to Date: 1 to 10
Date First Installed: 1982
(See Vendor Profile Page V-6)

COMPUTROL MEGA LINK Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections: 100 Maximum Distance: 50,000 Feet Transmission Media: Terrestrial Cossial Cable Access Method: Centralized Master/Slave Polling, Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, SDLC, HDLC Asynchronous, SULC, PUBLIC Network Compatibility: DEC DNA/Decnet Interfaces Supported: RS-232C, IEEE 488, High-Speed Bus Advanced Functions: Diagnostics Price: Purchase: \$100 to \$3,000 tribution Method: End user, OEM, Third-party Number installed to Date: Over 100 Date First installed: May 1980 (See Vendor Profile Page V-7)

CONCORD DATA SYSTEMS

TOKEN/NET Topology: Bus (tree)
Network Type: Broadband
Maximum Physical Connections: 2 000 Maximum Distance: 25 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Polling Types) Protocols Supported: Asynchronous, Hasp, Synchronous, X.25, Bisynchronous, T-1, SDLC, Network Compatibility: IEEE 802.4 Interfaces Supported: RS-232C, IEEE 488, RS-449, V.24 Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting Purchase: \$500 to \$1,000

# Local-Area Networks

Distribution Method: End user, OEM Number Installed to Date: 1 to 10 Date First Installed: October 1983 (See Vendor Profile Page V-7)

CONTEL INFORMATION

SYSTEMS
CONTEL NET
Topology: Bus (tree)
Network Type: Both
Maximum Physical Connections:
5,000
Maximum Distance: 5 Miles
Transmission Media: Terrestrial
Cosxial Cacle
Accesses Method: Distributed

Access Method: Distributed CSMA/CD (Contention Type) Frotocols Supported: Asynchronous, X.25, Bisynchronous, 3270 Interfaces Supported: RS-232C

Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting Palce:

Purchase: \$300 to \$500 Distribution Method: End user Number installed: to Date: 25 to 50 Date First installed: 1981 (See Vendor Profile Page V-7)

CONVERGENT TECHNOLOGIES, INC.

CT-CLUSTER Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections: 255 Maximum Distance: 2,500 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Centralized Master/Slave Polling Protocols Supported: Synchronous, X 25 Bisynchronous SDLC HDLC Ascii, SNA ASCI, SNA Network Competibility: IBM SNA, IBM BSC, Telenet, Tymnet Interfaces Supported: RS-232C Distribution Method: OEM Number installed to Date: Over 100 Date First Installed: November 1980 (See Vendor Profile Page V-8)

CORVUS SYSTEMS, INC. OMNINET

Topology: Bus (Linear)
Notwork Type: Basoband
Illiazimum Physical Connections: 64
Maximum Distance: 4,000 Feet
Transmisation Media: Terrestrial
Twisted Wire
Access Method: Distributed
CSMA/CD (Contention Type)
Protocols Supported:
Asynchronous, X.25, Ascil
Network Compatibility: ISM SNA
Interfaces Supported: RS-232C,
IEEE 488, RS-4224/23
Advanced Functions: Diagnostics
Pricie:

Price:
Purchase: \$495 to \$1,500
Distribution Method: Third-party
Number Installed to Date: Over 100
Date First Installed: September
1979
(See Vendor Profile Page V-8)

CPT CORP.
OFFICE DIALOGUE
Topology: Star
Network Type: Baseband
Maximum Physical Connections:
16
Transmission Media: Terrestrial

Transmission involue: Terresmail Twisted Wire Access Method: Master/Slave Polling (Certralized) Protocole Supported: Bisynchronous, SDLC, Asoli, X.25 HDLC Network Competibility: IBM SNA.

X.25 Interfaces Supported: RS-232C, RS-422/423 Advanced Functions: Security/Encryption, Diagnostics

Purchase: \$30,000 to \$42,000 Distribution Method: Third-party (See Vendor Profile Page V-8)

CR COMPUTER SYSTEMS
X-NET
Topology: Bus (tree)
Network Type: Baseband
Maximum Physical Connections:

Maximum Physical Connections: 2,032
Maximum Distance: 3 Miles Transmission Media: Twin-Ax Access Method: Centralized Master/Slave Polling Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, Synchronous, X.25, Choneywell DSE/DSA, Burroughs DEC DNA/Decent, IBM BSA, Choneywell DSE/DSA, Burroughs BNA, Sperry DCA, HP DSN Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting Pales.

Price:
Purchase: \$1,000
Distribution Method: End user
Number Installed to Date: 50 to 100
Date First Installed: February 1972
(See Vendor Profile Page V-8)

CYB SYSTEMS, INC. UNITE Topology: Bus (Linear)

Network Type: Besobard Maximum Physical Connections: 32 Maximum Distance: 1,000 Feet Transmission Media: Terrestrial Coaxial Cable Interfaces Supported: RS-232C Advanced Functions: MOD, DOS, Unic, Passwording Distribution Method: End user Number Installed to Date: 1 to 10 (See Vendor Profile Page V-8)

CYGNET TECHNOLOGIES, INC.
COSYSTEM
Topology: Star
Network Type: Broadband
Mazimum Distance: 3,000 Miles
Transmission Media: Terrestrial
Twisted Wire
Protocots Supported: Hasp,
Synchronous, X.25, Bisynchronous,
T-1, SDI.C. HDI.C.

Network Compatibility: IBM BSC, HP DSN Interfaces Supported: Ascil Asynchronous Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting Price:

Price:
Purchase: \$1,495 to \$1,845
Distribution Method: Third-party
Date First Installed: September
1988
(See Vendor Profile Page V-8)

DAROME, INC.
CONVENER-NETWORK
CONFERENCING UNIT
Topology: Ring
Network Type: Baseband
Maximum Physical Connections:
20

Transmission Media: Terrestrial Twisted Wire Access Method: Dial-up

Purchase: \$550 to \$1,700 Distribution Method: End user Number installed to Date: Over 100 Date First Installed: 1972 (See Vandor Profile Page V-8)

DAROME, INC.
CONVENER-PHONE
CONFERENCING UNIT
Topology: Ring
Network Type: Baseband
Maximum Physical Connections:
20
Transmission Media: Terrestrial
Twisted Wire

Price: Purchase: \$550 to \$1,700 Distribution Method: End user Number installed to Date: Over 100 Date First installed: 1972

Access Method: Dial-up

DAROME, INC.
DAROME 2020 COCONVENER
Topology: Ring
Network Type: Baseband
Maximum Physical Connections:
20

Access Method: Dial-up
Distribution Method: End user
Number Installed to Date: 50 to 100
Date First installed: 1976

DATABIT, INC.
ANP 3520 (ADVANCED NETWORK
PROCESSOR)
Topology: Wide Area PacketSwitching
Network Type: Packet-Switching
Protocols Supported:
Asynchronous, X.25, Bisynchronous,
Asoli, 3270 Bisynchronous,
Asoli, 3270 Bisynchronous,
Telenet, Tymeit, X.25, X.75,
Gatteway
Interfaces Supported: RS-232C,
RS-422/423, V.35
Advanced Functions: Performance
Analysis, Alarms, Orl-Ine
Configuration
Number Installed: Date: 10 to 25
Date First Installed: September
1983
Use Vendor Profile Page V-9)

DATABIT, INC.

EDX.P

Network Type: Packet-Switching Transmission Medica: Terrestrial Twisted Wire, Coasial Cable; Free Space Fiber Optics, Infrared Light, Microwaves; Satellite Access Methods Centralized PBX (Switching Type), Mester/Slave Poiling, X.25, X.75 et Protocols Supported, Network Compatibility: IBM BSC, Telenst, DDS, Tymnet, Packet Interfaces Supported: RS-232C, CCITT Interfaces Supported: RS-232C, CCITT Reporting, Terror Checking, Congestion Control Distribution Methods: End user Number Installed to Darke: 50 to 100 Date First Installed: 1981 100 Date Fir

DATA GENERAL CORP.
XODAC/NETWORK BUS
SYSTEM/4480
Topology: Bus (Linear)
Network Type: Baseband
Maximum Physical Connections:
32
Maximum Distance: 1 Mile
Transmission Media: Torrestrial
Coaxial Cable
Access Method: Distributed Token
Passing (Polling Types)
Protocols Supported: Xodiac
Network Compatibility: IBM SNA,
IBM BSC, Telenet, Tymnet
Interfaces Supported: RS-232C,
RS-422/423, ML. 188C, RS-449,
CCITT
Distribution Method: End user
Date First Installed: Fobruary 1982
(See Vendor Profile Page V-9)

DATAPOINT CORP.

Topology: Bus (tree)
Network Type: Baseband
Maximum Physical Connections:
255
Maximum Distance: 4 Miles
Transmission Media: Terrestrial
Coaxial Cable

Access Method: Distributed Token Passing (Polling Types) Protocole Supported: Asynchronous, Synchronous, X.25, Blsynchronous, T-1, SDLC, HDLC, Ascil

Ascillorito Ross, Terr., Sabc., Hotel Herwork Competibility: IBM SNA, IBM BSC, Honeywell DSE/DSA, Burroughs BNA, Sperry DCA, Arc Link, Telenet, Tymnet Interfaces Supported: RS-232C Advanced Function, Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting

Lease: \$280 to \$5 Purchase: \$5,00 to \$8,950 Average Monthly Maintenance: \$70 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: October 1977 (See Vendor Profile Page V-9)

Reporting

DATASTREAM COMMUNICATION, INC.

774 Network Type: Baseband Maximum Physical Connections:

Transmission Media: Terrestrial Access Method: Dial-up Protocols Supported: Bisynchronous, Asol, Ebodic Network Competibility: IBM SNA Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$4,000 to \$10,000 verage Monthly Maintenance: Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: 1980 (See Vendor Profile Page V-9)

DATASTREAM COMMUNICATION, INC.

Network Type: Baseband Maximum Physical Connections: emission Media: Terrestrial Coaxial Cable Access Method: Dial-up Protocols Supported: Bisynchronous, Ascil, Ebodic Network Compatibility: IBM SNA Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$4,000 to \$6,000 **Average Monthly Maint** \$100 Distribution Method: End user Number installed to Date: Over 100 Date First Installed: 1980

COMMUNICATION, INC. 874

Network Type: Baseband Maximum Physical Connections: Transmission Media: Terrestrial

Coaxial Cable Access Method: Dial-up Protocole Supported: Ascii, Ebodic Network Competibility: IBM SNA Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purcha se: \$16,000 rage Monthly Mainte \$115

Distribution Method: End user Number installed to Date: Over 100 Date First Installed: 1981

COMMUNICATION, INC.

Network Type: Baseband Maximum Physical Connections: Transmission Media: Terrestrial

Coaxiel Cable Access Method: Dial-up
Protocols Supported: Ascil, Ebodic
Network Compatibility: IBM SNA
Interfaces Supported: RS-23C
Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$6,000 to \$12,000 Average Monthly Maintenance: \$150

Number installed to Date: 1 to 10 Date First Installed: January 1984

DAVONG SYSTEMS, INC. DS200-015 Topology: Ring Network Type: Baseband Maximum Physical Connections:

Transmission Media: Terrestrial Coaxial Cable
Access Method: Distributed Token Passing (Polling Types) Network Compatibility: IBM SNA, XNS (Xerox) nced Functions: Diagnostics

Purchase: \$645 Distribution Method: Third-party Number Installed to Date: 50 to 100 Date First Installed: April 1983 (See Vendor Profile Page V-10)

DCA INA/NETWORK Topology: Bus (Linear and Tree),

Network Type: Both Maximum Physical Connections: Transmission Media: Terrestrial Twisted Wire, Coaxial Cable, Fiber Optics; Free Space Infrared Light,

Microwaves, Laser, Satellite

Protocols Supported: Asynchronous, HASP, Synchronous, X.25, Bisynchronous, T-1, SDLC, Network Compatibility: IBM SNA, DEC DNA/Decnet, IBM BSC. Honeywell DSE/DSA, Burroughs

BNA, Primenet, Sperry DCA, XNS (Xerox), HP DSN, Arc Link, Omninet, Teienet, DDS, Tymnet Interfaces Supported: RS-232C, RS-422/423. CCITT Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic

Reporting Distribution Method: End user, OEM, Third-party (See Vendor Profile Page V-10)

DELTA SYSTEMS, INC.

WHITE BOX I Topology: Bus (Linear) Network Type: Broadband Maximum Physical Connections: 2 Maximum Distance: 13,000 Miles Transmission Media: Leased Lines Access Method: Centralized Master/Slave Polling Protocols Supported: Asynchronous, Synchronous, Ascii rork Compatibility: ICL System Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis

Purchase: \$1,500 Average Monthly Maintenance: \$75 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: December 1980 (See Vandor Profile Page V-10)

THE DESTEK GROUP

DESNET Topology: Bus (Linear) Network Type: Fiberoptics Maximum Physical Connection 350

Maximum Distance: 6,500 Feet Transmission Media: Terrestrial Coaxial Cable, Fiber Optics Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: HDLC Network Compatibility: IBM SNA Interfaces Supported: RS-232C, IEEE 488, IBM PC Advanced Functions: Diagnostics, Usage/Traffic Reporting Price:

Purchase: \$500 to \$700 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: November 1982 (See Vendor Profile Page V-10)

DIGITAL EQUIPMENT CORP. DECNET

Topology: Bus (Linear), Star Network Type: Both Maximum Physical Connections: 1.023

Transmission Media: Terrestrial Transmission media: Terrossis Coexial Cable Access Method: Centralized Master/Slave Polling, Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Hasp, Synchronous, X.25, Bisynchronous, SDLC, Asoli Network Competibility: IBM SNA, DEC DNA/Decnet, IBM BSC, Telenet, Tymnet Interfaces Suppor Interfaces Supported: RS-232C, RS-422/423, RS-449, CCITT Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting Date First Installed: 1976 (See Vendor Profile Page V-10)

DIGITAL MICROSYSTEMS, INC. (DMS) HINET

Topology: Star, Ring Network Type: Baseband Maximum Physical Connections: mission Media: Terrestrisi

Fiber Optics Access Method: Master/Slave Polling (Centralized)
Protocols Supported: Uniscope
Network Compatibility: IBM BSC, Sperry DCA Interfaces Supported: RS-232C, Advanced Functions: Diagnostics, Price:
Purchase: \$950
Distribution Method: End user
(See Vendor Profile Page V-10)

Performance Analysis, Usage/Traffic

FUJITSU AMERICA, INC. OPTICAL DATA HIGHWAY Topology: Ring Network Type: Fiber Optic Maximum Physical Conne

Maximum Distance: 2 Miles Transmission Media: Terrestrial Fiber Optics Access Method: Centralized PBX (Switching Type)
Protocols Supported:
Asynchronous, HASP, Synchronous, X.25, Bisynchronous, T1, SDLC, HDLC, Ascii ses Supported: RS-232C.

Advanced Functions: Diagnostics Number installed to Date: 1 to 10 Date First Installed: January 1984 (See Vandor Profile Page V-12)

GANDALF DATA, INC. Topology: Star Network Type: Baseband Maximum Physical Connections: 8 Transmission Media: Terrestrial Twisted Wire, Coaxial Cable, Fiber Ontics Access Method: Centralized PBX (Switching Type)

Asynchronous, Synchronous, X.25, Bisynchronous, T-1, SDLC, HDLC. Network Competibility: IBM SNA IBM BSC, Telenet, DDS, Tymnet Interfaces Supported: RS-232C, RS-422/423, MIL 188C, RS-449, CCITT, 20 mA

Advanced Functions: Diagnostics, Usage/Traffic Reporting Purchase: \$500 to \$135

Average Monthly Maintenance: Number Installed to Date: 25 to 50 Date First Installed: October 1982 (See Vendor Profile Page V-12)

GATEWAY COMMUNICATIONS, INC.

G/re: I Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 7,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Hasp, Synchronous, X.25, Bisynchronous, SDLC, HDLC,

Network Compatibility: IBM SNA, IBM BSC, Primenet, Tymnet Interfaces Supported: RS-232C, RS-422/423, V35

### Local-Area Networks

Advanced Functions: Diagnostics, Performance Analysis

Purchase: \$595
Distribution Method: OEM
Number installed to Date: Over 100
Date First Installed: September
1983
(See Vendor Profile Page V-12)

GENERIAL ELECTRIC CO.
GEMLINK LD5-072A
Topology: Point to Point
Network Typa: Microwave
Maximum Distance: 10 Miles
Transmission Media: Free Space
Microwaves
Protocols Supported: Asynchronous
Interfaces Supported: R-232C
Distribution Method: Triird-party
Number Installated: Date: 1,000
Date First Installed: March 1982

GENERAL ELECTRIC CO.
GEMLINK LDS-082A
Network Type: Microwave
Maximum Distance: 10 Miles
Transmission Media: Free Space
Microwaves
Protocols Supported: Synchronous
Network Compatibility: All
Synchronous
Interfaces Supported: RS-232C,
RS-422/423, RS-449
Distribution Method: Third-party
Mumber Installed to Date: 1,000

(See Vendor Profile Page V-13)

GENERAL ELECTRIC CO. GEMLINK LSD-112A122A Topology: Point to Point Network Type: Microwave Mazinsam Distance: 7 Miles Transmission Media: Free Space Microwaves Protocole Supported: Synchronous,

Date First installed: March 1982

Network Compatibility: All Synchronous Interfeces Supported: RS-422/423, DSX-1,1C Distribution Method: Third-party Number Installed to Date: 1,000 Date First Installed: March 1982

GENERIAL ELECTRIC CO. LSID-062A Topology: Point to Point Network Type: Microwave Blazzimum Distance: 7 Miles Transmission Media: Free Space Microwaves Protocole Supported: Synchronous Interfaces Supported: RS-232C, RS-422/423, RS-449, V.35 Distribution Method: Third-party Humber Installed: March 1982 Date First Installed: March 1982

GIOULD, INC. MODWAY Topology: Bus (tree) Network Type: Both Maximum Physical Connections: 250 Maximum Distance: 3 Miles

Maximum Distance: 3 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Rolling Types) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, T-1, SDLC, HDLC, Acci, Modbus Interfaces Supported: RS-232C, RS-449, DMA Advanoad Functions: Disgnostics, Performance Analysis, Usage/Traffic Reporting, Network Reconfiguration

Distribution Method: End user Date First Installed: January 1983 (See Vendor Profile Page V-13) HARRIS CORP. HARRIS 9070 (BASEBAND) Topology: Bus (Linear)

Purchase: \$1,500

Network Type: Baseband Maximum Physical Connections: 32 Maximum Distance: 5,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Polling Types) Protocols Supported: Asynchronous, Synchronous, Synchronous, SULC Network Compatibility: IBM SNA Interfaces Supported: RS-22C, RS-422/423, RS-449 Advanced Functione: Diagnostics, Performance Analysis Philips.

(See Vendor Profile Page V-14)

HARRIS CORP.

HARRIS 9070 (BROADBAND)

Topology: Bus (Linear)

Network Type: Broadband

Maximum Physical Connections:
1,000

Purchase: \$1,250 Distribution Method: End user

1,000
Miximum Distance: 3 Miles
Transmission Media: Terrestrial
Coxxial Cable
Access Method: Distributed Token
Passing (Poling Types)
Protocols Supported:
Asynchronous, Synchronous,
Bioynchronous, SpLC
Network Compatibility: IBM SNA
Interfaces Supported: RS-232C,
RS-422423, RS-449
Advanced Functions: Diagnostics,
Usage/Traffic Reporting
Price:

Purchase: \$1,250 Distribution Method: End user

IDEAS, INC. INET Topology: Bus (tree) Network Type: Broadband Maximum Physical Connections: 1,000 Maximum Distance: 5 Miles

Maximum Distance: 5 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, SDLC, HDLC, Asci Network Competibility: Distribution DNA/Decnet, Honeywell DSE/DSA, Burroughs BNA, Sperry, DCA, HP DSN, Telenet, Tymnet Interfaces Supported: RS-232C Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting Price:

Prices: \$500 Average Monthly Maintenance: \$20 Distribution Method: End user Date First Installed: July 1981 (See Vendor Profile Page V-15)

IDE ABSOCIATES, ING.
IDEANET/INFN-001 SPR-1N
Topology: Bus (Linear)
Network Type: Baseband
Maximum Plysical Connections:
04,000
Maximum Distance: 2,000 Feet
Transmission Media: Terrestrial
Coxidal Cable
Access Method: Distributed
Coxidal Cable
Access Method: Distributed
Coxidal Cable
Access Method: Distributed
Coxidal Cable
Contention Type)
Protocole Supported: SDLC, HDLC
Network Compatibility: PC-Net
Interfaces Supported: Coxidal
Connections
Advanced Functions: Disgnostics
Distribution Method: Third-party
(See Vendor Profile Page V-15)

IDE ASSOCIATES, INC.
IDEASHARE/SPR-18
Topology: SIVE 18
Nativent Type: RS-232
Nativent Type: RS-232
Nativent Media: RS-232
Nativent Compatibility: None Interfaces Supported: RS-232
Advanced Functions: Diagnostics
Distribution Media: RS-232
Distribution Method: Third-party
Date First Installed: December 1983

INSTOLINIK
SYSTEM 5000
Topology: Multidrop
Netherokt: Type: Bassband
Maximum Dietance: 15,000 Feet
Maximum Dietance: 15,000 Fe

Lease: \$90 to \$180
Purchase: \$2,000 to \$4,000
Average Monthly Maintenance: \$30
Distribution Method: End user
(See Vendor Profile Page V-15)

INTECOM, INC. LANMARK Topology: Star Network Type: Baseband Maximum Physical Connections: 32 Maximum Distances 54,000 Feet Transmission Media: Terestrial Transmission Media: Terestrial Twisted Wire, Fiber Optics Access Method: Certiralized PBX (Switching Typo) Network Compatibility: IBM SNA, Ethernet Interfaces Supported: IEEE 802 Advanced Functions: Diagnostics, Performance Analysis, Usaga/Traffic Reporting Prices: Purchase: \$500 to \$800 Distribution Method: End user (See Vendor Profile Page V-18)

INTERACTIVE 3 VSTEMS/3M
VIDEODATA LAN/1
Topology: Bus (tree)
Network Type: Broadband
Maximum Physical Connections:
286
Maximum Distance: 14 Miles
Transmission Media: Terrestrial
Coustid Callo
Access Method: Distributed Token
Passing (Poling Types)
Protocols Supported:
Asynchronous, Hasp, Asoli

Coxidal Cable
Access Method: Distributed Token
Passing (Poling Types)
Protocols Supported:
Asynchronous, Hasp, Asoli
Network Competibility: BM SNA,
IBM BSC, Sperry DCA
Interfaces Supported: RS-232C
Advanced Functions: Diagnostics,
Performance Analysis
Price:
Lesse: \$15 to \$25

Lease: \$15 to \$25 Purchase: \$400 to \$600 Distribution Method: End user Number Installed to Date: 1 to 10 Date First Installed: August 1983 (See Vendor Profile Page V-16)

INTERLAM, INEC.
INTERLAM NET/PLUS
Topology: Bus (Linear)
Network Type: Baseband
Maximum Physical Connections:
1,024
Maximum Distance: 2 Miles
Transmission Media: Terrestrial
Coaxial Cable
Access Method: Distributed
GSMA/CD (Contention Type)
Protocole Supported:
Asynchronous, Ascil
Network Compatibility: DEC
DNA/Decnet, XNS (Xerox), Telenet,
Tymnet
Interfaces Supported: RS-232C
Advanced Functions: Diagnostics,
Performance Analysis, Usage/Traffic
Reporting
Prices

Price:
Purchase: \$400
Distribution Method: End user
Number Installed to Date: Over 100
Date First Installed: September
1983
(See Vendor Profile Page V-16)

INTER-LINK STATIONMATE Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections: 64 Maximum Distance: 10,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Distributed CSMA/CD (Contention Type) Protocole Supported: Asynchronous, Ascii Network Compatibility: Telenet, Tymnet, Uninet Compuserve Interfaces Supported: RS-232C,

ced Functions: Diagnostics, Usage/Traffic Reporting, Password Protection

Purchase: \$1,450 Average Monthly Maintenance: \$15 Distribution Method: Third-party Number Installed to Date: 1 to 10 Date First Installed: November 1983 (See Vandor Profile Page V-16)

### INTERSIL SYSTEMS, INC.

GE NET Topology: Bus (Linear) Network Type: Broadband Maximum Physical Conne 1.000 Maximum Distance: 3 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, HDLC, Ascii, CCM Network Compatibility: DEC DNA/Decnet, DDS Interfaces Supported: RS-232C Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting

Purchase: \$800 to \$1,000 Distribution Method: End user Number Installed to Date: 25 to 50 Date First Installed: December 1982 (See Vendor Profile Page V-17)

### ITT TELECOM PRODUCTS.

INC. MULTITENENT Network Type: Baseband Access Method: Centralized PBX (Switching Type) Protocols Supported: Asynchronous, Synchronous, T-1, **Network Compatibility: DEC** DNA/Decnet Interfaces Supported: RS-232C Advanced Functions: Diagnostics, Advanced Flancaures Longitudes, Usage/Traffic Reporting Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: 1980 (See Vandor Profile Page V-17)

### JC SYSTEMS

JCS A-10 Topology: Bus (Linear)
Network Type: Broadband
Maximum Distance: 600 Feet Access Method: Centralized Master/Slave Polling Protocols Supported: Synchronous Network Compatibility: IBM SNA, IBM BSC Interfaces Supported: RS-232C. Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$495 Average Monthly Maintenance: Distribution Method: OEM, Third-

Number Installed to Date: 2,000 Date First Installed: May 1982 (See Vendor Profile Page V-17)

LOGICA, INC. POLYNET Topology: Ring
Network Type: Baseband
Maximum Distance: 2 Miles
Transmission Media: Terrestrial
Twisted Wire, Fiber Optics Access Method: DMA Protocols Supported: Asynchronous, Ascii

faces Supported: RS-232C, DEC Unibus Advanced Functions: Built-In Error

Prichase: \$1,400 to \$4,900
Distribution Method: Third-party
Number Installed to Date: 1 to 10 Date First Installed: January 1984 (See Vendor Profile Page V-18)

LYMCH COMMUNICATION SYSTEMS, INC. VOICE PLUS DATA SUBSCRIBER

CARRIER Topology: Point to Point Network Type: FSK Maximum Physical Connections: 1 Transmission Media: Terrestrial Protocols Supported: Asynchronous, Hasp, Synchronous,

X.25, Bisynchronous, T-1, SDLC, HDLC. Ascii Interfaces Supported: 4 Wire Advanced Functions: Diagnostics

Purchase: \$203 to \$256 Distribution Method: End user Number installed to Date: 25 to 50 (See Vendor Profile Page V-18)

METAPATH, INC. ROBIN DESKTOP DATA SWITCH Topology: Bus (Linear)

Network Type: Baseband Maximum Physical Connections: Maximum Distance: 5,000 Feet Transmission Media: Terrestrial Coaxial Cable

Access Method: Absent Token Protocols Supported: Asynchronous, Ascii Network Compatibility: IBM SNA, IBM BSC, XNS (Xerox), Telenet, DDS, Tymnet Interfaces Supported: RS-232C, Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic

Purchase: \$400 Distribution Method: OEM, Third-

Reporting

er installed to Date: 50 to 100 (See Vendor Profile Page V-19)

MICOM SYSTEMS, INC. INSTANET

INSTANET
Topology: Star
Network Type: TDM
Transmission Media: Terrestrial
Twisted Wire; Free Space Microwaves, Laser Access Method: Centralized PBX (Switching Type) Protocola Supported: Asynchronous, X.25, T-1. Ascii Network Compatibility: Telenet, orfaces Supported: RS-232C, RS-422/423 Advanced Functions: Diagnostics,

Purchase: \$100 to \$250 verage Monthly Maintenance: \$400

Usage/Traffic Reporting

Distribution Method: End user Number Installed to Date: More Than 100 **Date First Installed: September** 

(See Vendor Profile Page V-19)

MODULAR COMPUTER SYSTEMS, INC. (MODCOMP)

Topology: Bus (tree) Network Type: Baseband Maximum Physical Connecti

Maximum Distance: 600 Miles Transmission Media: Terrestrial Twisted Wire, Coaxial Cable, Ribbon/Parallel Wire, Fiber Optics; 4

Access Method: Maxnet Protocols Supported: Maxnet Proprietary Interfaces Supported: RS-232C, V.25, WE301 Advanced Functions: Diagnostics, Usage/Traffic Reporting

Purchase: \$3,500 to \$30,000 Distribution Method: OEM Number Installed to Date: Over 100 Date First Installed: September

(See Vendor Profile Page V-20)

NBI, INC. Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 8,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Bisynchronous Network Compatibility: IBM SNA, IBM BSC Interfaces Supported: RS-232C, **IEEE 802.3** Advanced Functions: Diagnostics, Usage/Traffic Reporting

Purchase: \$900 Distribution Method: Third-party Date First Installed: June 1984 (See Vendor Profile Page V-21)

HCR CORP. MIRLAN (MID RANGE LAN) Topology: Bus (tree)
Network Type: Baseband
Maximum Distance: 12,000 Feet
Access Method: Distributed CSMA/CD (Contention Type)
Distribution Method: End user
(See Vendor Profile Page V-21)

NCR DECISION NET Topology: Bus (Linear) Network Type: Baseband Maximum Physical Conne

Maximum Distance: 4,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Omninet Network Compatibility: Omninet Advanced Functions: Diagnostics, Usage/Traffic Reporting, File Sharing

Purchase: \$500 Distribution Method: End user Date First Installed: October 1983

HESTAR SYSTEMS, INC.

PLAN SERIES Topology: Star twork Type: Baseband eximum Physical Connections:

Maximum Distance: 4 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Polling Types) Asynchronous, Hasp, Synchronous, Bisynchronous, T-1, SDLC, HDLC, Ascii, Spreadsheats Network Competibility: IBM SNA, IBM BSC, XNS (Xerox), Arc Link, Telenet, Tymnet Interfaces Supported: RS-232C. CCITT

Advanced Function Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$2,000 to \$100,000 Purchase: \$2,000 to \$100,000 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: January 1982 (See Vendor Profile Page V-21)

HETWORK PRODUCTS, INC. LOCAL MUX Topology: Point to Point Network Type: Baseband Maximum Physical Connections: Maximum Distance: 10,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Direct Protocols Supported: Asynchronous, Hasp, Synchronous X.25, Bisynchronous, SDLC, HDLC, Interfaces Supported: RS-232C Advanced Functions: Diagnostics

Purchase: \$106 Average Monthly Maintenance: \$13 Distribution Method: End user

# Local-Area Networks

Number Installed to Date: Over 100 Date First Installed: April 1983 (See Vendor Profile Page V-21)

### NETWORK SYSTEM CORP. HYPER BUS

Topology: Bus (tree) Network Type: Baseband Meximum Physical Connections: 200

Maximum Distance: 4,080 Feet Transmission Media: Terrestrial Coaxial Cable; Free Space Infrared Light, Microwaves, Laser; Satellite Appeas Method: Virtual Timesharing

cols Supported: Asynchronous, Synchronous, Bisynchronous, T-1, SDLC, Ascii Network Compatibility: IBM SNA, IBM BSC, DDS Interfaces Supported: RS-232C, IEEE 488, RS-422/423, MIL 188C, RS-449, CCITT, 306 Advanced Functions: Diagnostics, Usage/Traffic Reporting Price:

Purchase: \$8,000 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: 1982 (See Vendor Profile Page V-21)

### **HETWORK SYSTEM CORP.** HYPER CHANNEL

Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 1,200 Feet Transmission Media: Terrestrial Coaxial Cable; Free Space Infrared Light, Microwaves, Laser; Satellite es Method: Distributed CSMA/CD (Contention Type) Protocole Supported: Hasp Synchronous, Bisynchronous, T-1, SDLC, HDLC, Ascii, T-2, T-3 Network Compatibility: IBM SNA, IBM BSC, Burroughs BNA, DDS Interfaces Supported: RS-232C, IEEE 488, RS-422/423, MIL 188C, RS-449, CCITT, 306 Advanced Functions: Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$40,000 Distribution Method: End user Number installed to Date: Over 100 Date First installed: 1974

### NORTHERN TELECOM, INC. Topology: Ring Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 5,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Polling Types) Protocols Supported: Asynchronous, Hasp, Synchronous, Bisynchronous, SDLC, Ascii Network Competibility: IBM SNA, IBM BSC, Burroughs BNA, Sperry

DCA, Telenet, Tymnet Interfaces Supported: RS-232C Advanced Functions: Diagnostics

Price: Purchase: \$1,600 to \$1,600 Distribution Method: End user Date First Installed: 1977 (See Vendor Profile Page V-22)

NETWARE-8 Topology: Star Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 3,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Proprietary Protocols Supports Asynchronous, X.25, Ascii Network Compatibility: Arc Link, DDS

Interfaces Supported: BS-232C RS-422/423, MIL 188C Advanced Functions: Security/Encryption, Diagnostics Performance Analysis, Usage/Traffic Reporting

Purchase: \$250 Distribution Method: OEM. Thirdparty

Number installed to Date: 600 Date First installed: December 1981 (See Vendor Profile Page V-22)

NETWARE-X Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 4,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Novel Proprietary Protocols Supported: Asynchronous, X.25, Ascii Network Competibility: Arc Link, Omninet Interfaces Supported: RS-232C, RS-422/423, MIL 188C Advanced Functions: Security/Encryption, Diagnostics,

Performance Analysis, Usage/Traffic Reporting Purchase: \$695 Average Monthly Maintenance: Distribution Method: Third-party Date First Installed: April 1983 enance: \$35

OMNINET

Topology: Bus (Linear and Tree Network Type: Baseband Maximum Physical Connections:

Maximum Dietance: 4,000 Feet Transmission Media: Terrestrial Twisted Wire Access Method: Distributed CSMA/CD (Contention Type) Network Competibility: SDLC Interfaces Supported: RS-422/423 Advanced Functions: Security/Encryption, Diagnostics,

Usage/Traffic Reporting Purchase: \$500 to \$1,000 Distribution Method: OEM, Third-

Number installed to Date: 50 to 100 Date First Installed: October 1982 (See Vendor Profile Page V-22)

ORCHID TECHNOLOGY, INC.

Topology: Distributed Bus Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 7,000 Feet Transmission Media: Terrestrial Coaxial Cable CSMA/CD (Contention Type) Protocole Supported: SDLC
Network Competibility: IBM SNA
Interfaces Supported: RS-232C
Advanced Functions: Performance Analysis, Usage/Traffic Reporting. Execution

Purchase: \$695
Distribution Method: End user
Number Installed to Date: Over 100
Date First Installed: October 1982
(See Vendor Profile Page V-22)

PERCOM DATA CORP.

PERCOM NET Topology: Ring Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 25 Miles Transmission Media: Terrestrial Twisted Wire Access Method: Distributed Token Passing (Polling Types)
Protocols Supported: Western Digital etwork Compatibility: Western Digital 2840 Interfaces Supported: RS-422/423 Advanced Functions: Security/Encryption

Price:
Purchase: \$595 to \$1,700
Distribution Method: Third-party
Number installed to Date: 1 to 10 Date First Installed: November 1983 (See Vendor Profile Page V-23)

### PERIPHERAL TECHNOLOGY,

SNC Topology: Star Network Type: Baseband Maximum Physical Connections: 5 Maximum Distance: 8,000 Feet Transmission Media: Twisted Wire Access Method: Centralized Master/Slave Polling Protocols Supported: Asynchronous, Synchronous, Bisynchronous, Ascii Network Compatibility: IBM BSC Interfaces Supported: RS-232C, RS-422 Advanced Functions: Security/Encryption, Diagnostics Price:

Purchase: \$600 Distribution Method: End user Number Installed to Date: 10 to 25 Date First Installed: November 1963 (See Vendor Profile Page V-23)

PERQ SYSTEMS

ETHERNET Topology: Bus (tree) Network Type: Broadband Maximum Physical Connection 1.024

maximum Distance: 2 Miles Transmission Media: Terrestrial Coaxial Cable Access Maria CSMA/CD (Contention Type) Asynchronous, Synchronous, X.25
Network Competibility: DEC
DNA/Decnet

rted: RS-232C. IEEE 488, GPIB-1 **Advanced Functi** Security/Encryption, Diagnostics

Lease: \$1,800

Distribution Method: OEM Number Installed to Date: Over 100 Date First Installed: 1982 (See Vendor Profile Page V-23)

PHOENIX DIGITAL CORP. OPTONET

Topology: Ring, Single/Multiple Ring Network Type: Baseband Maximum Physical Connections: 256

Maximum Distance: 2 Miles Trensmission Media: Terrestrial Twisted Wire, Fiber Optics; Free Space Infrared Light, Las Access Method: Centralized Master/Slave Polling; Distributed Token Passing (Polling Types)
Protocols Supported: Asynchronous, Hasp, Synchronous X.25, Bisynchronous, SDLC, HDLC, Ascii, DDCMP

Network Compatibility: IBM SNA, DEC DNA/Decnet, Honeywell DSE/DSA, Modbus, Asynchronous/ Bisynchronous Data Highway Interfaces Supported: RS-232C, IEEE 488, RS-422/423, RS-449, CCITT

**Advanced Function** Security/Encryption, Diagnostics Performance Analysis, Usage/Traffic Reporting, Network Monitor

Purchase: \$100,000 Distribution Method: End user Number Installed to Date: 50 to 100 Date First Installed: August 1980 (See Vendor Profile Page V-23)

PRAGMATRONICS, INC.

Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 5 Miles Transmission Media: Terrestrial Coaxial Cable; Free Space Infrared Light

cess Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Synchronous, HDLC,

Network Compatibility: Transport interfaces Supported: RS-232C, RS-422/423

Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Price:

Lease: \$25 to \$33 Purchase: \$600 to \$800

Distribution Method: End user

Number Installed to Date: 1 to 10

Date First installed: 1979 (See Vendor Profile Page V-24)

### PRIME COMPUTER, INC.

RINGNET Topology: Ring Network Type: Baseband Access Method: Distril Passing (Polling Types) thod: Distributed Token Protocols Supported:
Asynchronous, HASP, Synchronous,
X.25, Bisynchronous, SDLC, HDLC, Ascil patibility: IBM BSC, Honeywell DSE/DSA, Primenet, Sperry DCA, Telenet, Tymnet Interfaces Supported: RS-232C, CCITT

Purchase: \$5,000 Average Monthly Maintenance Distribution Method: End user (See Vendor Profile Page V-24)

PROLINK CORP.
PROLOOP NETWORK Topology: Ring Natwork Type: Baseband Maximum Physical Conne

Maximum Distance: 62,000 Feet Transmission Media: Terrestrial Coaxial Cable **Access Method: Slotted Bus** Protocols Supported: Synchronous, Bisynchronous, SDLC, Ascii, ISO Equivalent Network Compatibility: IBM SNA, IBM BSC, IBM 3101, BT 100 Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics Performance Analysis, Usage/Traffic Reporting, System Customization on Method: End user Number installed to Date: 10 to 25 Date First installed: October 1981 (See Vendor Profile Page V-24)

### PROTEON ASSOCIATES, INC. PRONET

Topology: Star Network Type: Baseband, Broadband and Fiber Optic **Maximum Physical Connections:** 

Maximum Distance: 620 Miles Transmission Media: Terrestrial Twisted Wire, Coaxial Cable, Fiber Optics; Free Space Infrared Light Access Method: Distributed Token Passing (Polling Types) Protocols Supported: Asynchronous, Hasp, Synchronous, X.25, Bisynchronous, HDLC Network Compatibility: IBM SNA, DEC DNA/Decnet, HP Interfaces Supported: RS-232C. **IEEE 488** Advanced Functions: Security/Encryption, Diagnostics,

Performance Analysis, Usage/Traffic Reporting

Purchase: \$600 to \$2,800 Distribution Method: End user Number installed to Date: 50 to 100 Date First installed: June 1981 (See Vendor Profile Page V-24)

RACAL-MILOO, INC. PLANET Topology: Ring Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 7 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed Token Passing (Polling Types)
Protocols Supported:
Asynchronous, Hasp, Synchronous, X.25, Bisynchronous, T-1, SDLC, HDLC. Ascii

Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting, On-line Inventory

Lease: \$25 to \$60 Price:

Purchase: \$600 to \$900 Distribution Method: End user Number Installed to Date: 50 to 100 Date First Installed: March 1983 (See Vendor Profile Page V-24)

### RAYTHEON CO.

RAYNET IV Topology: Bus (Linear) Network Type: Broadband Maximum Physical Connections: Transmission Media: Terrestrial

Coaxial Cable, Ribbon/Parallel Wire; Satellite Access Method: Centralized Master/Slave Polling Protocols Support Bisynchronous, ALC Network Compatibility: IBM BSC, Sperry DCA, Telenet, Tymnet Interfaces Supported: RS-232C, MIL 188C Advanced Function Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting, Message Switching

Lease: \$5,000 Average Monthly Maintenance: \$2,500

Distribution Method: End user Number installed to Date: 1 to 10 Date First installed: 1982 (See Vendor Profile Page V-25)

# SCIENTIFIC DATA SYSTEMS.

INC. SDS NETWORK Topology: Ethernet Bus Network Type: Broadband **Maximum Physical Connections:** Transmission Media: Terrestrial

Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Synchronous, HDLC.

Interfaces Supported: RS-232C

Purchase: \$5,000 to \$6,000 Average Monthly Maintenance: \$55 Distribution Method: Third-party Number Installed to Date: 25 to 50 Date First Installed: November 1982 (See Vendor Profile Page V-26)

STANDARD DATA CORP. Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 4,000 Feet Transmission Media: Terrestrial Coaxial Cable, Fiber Optics; Free Space Microwaves, Laser Access Method: Distributed CSMA/CD (Contention Type) , CSMA/CA

Network Compatibility: IBM SNA, DEC DNA/Decnet, IBM BSC, Honeywell DSE/DSA, Burroughs BNA, Primenet, Sperry DCA, XNS (Xerox), HP DSN, Arc Link, Omninet, Telenet, DDS, Tymnet orted: RS-232C. Interfaces Supports IEEE 488, IEEE 696 Advanced Functions:

Security/Encryption, Diagnostics, Usage/Traffic Reporting

Purchase: \$005 Distribution Method: Third-party Number Installed to Date: 10 to 25 Date First Installed: October 1983 (See Vendor Profile Page V-28)

# STEARN COMPUTER

MICRONETWORK Topology: Star Network Type: Baseband Maximum Physical Connections:

Maximum Distance: 6,000 Feet Transmission Media: Terrestrial Fiber Optics Protocols Supported: SDLC Interfaces Supported: RS-422/423 Advanced Functions: Diagnostics, Usage/Traffic Reporting

Purchase: \$4,000 to \$6,000 Distribution Method: Third-party (See Vendor Profile Page V-28)

### STRATUS COMPUTER, INC. STRATALINK Topology: Ring Network Type: Baseband Maximum Physical Connections:

Meximum Distance: 2,500 Miles Transmission Media: Terrestrial Coaxial Cable Access Method: Proprietary X.25-

Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, SDLC, HDLC, Ascii, X.29 FTPS Network Compatibility: IBM SNA.

Interfaces Supported: RS-232C, RS-422/423, Bus Interface Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting Note that installed to Date: 25 to 50

Date First installed to November 1981
(See Vendor Profile Page V-28)

### SYNTREY, INC. SYNNET Topology: Bus (tree) Network Type: Baset

Maximum Physical Connections: 420 Maximum Distance: 1,700 Feet Transmission Media: Terrestrial Coaxial Cable Access Method: Distributed CSMA/CD (Contention Type) Protocole Supported: Asynchronous, Synchronous, Bisynchronous, SDLC, Ascii, Syntrex Proprietary Network Compatibility: Syntrex Proprietary Interfaces Supported: RS-232C, Syntrex Proprietary **Advanced Function** na: Diagnostics, Usage/Traffic Reporting

Purchase: \$650 Average Monthly Maintenance: \$60 Distribution Method: End user, Number Installed to Date: 10 to 25 Date First Installed: 1983 (See Vendor Profile Page V-28)

### SYTEK, INC. LOCAL NET

Topology: Bus (tree) Network Type: Broadband Maximum Physical Connections: 24,000 Maximum Distance: 70 Miles Transmission Media: Terrestrial Coaxial Cable
Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: Asynchronous, Synchronous, X.25, Bisynchronous, Ascii Network Compatibility: IBM BSC, XNS (Xerox), HP DSN, Telenet, Tymnet, X.25 Interfaces Supported: RS-232C Advanced Functions: Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic Reporting, Name-Serving, Access Control

Purchase: \$345 to \$545 Average Monthly Maintenance: \$5 Distribution Method: End user Number installed to Date: Over 100 Date First Installed: January 1981 (See Vendor Profile Page V-29)

### TANDEM COMPUTERS, INC. NONSTOP II

Topology: Double Ring Network Type: Fiber Optics Maximum Physical Connections: 255 nission Media: Fiber Optics

# **Local-Area Networks**

Accese Method: EXP (Proprietary)
Fox
Protocols Supported:
Asynchronous, X.25, HDLC
Average Monthly Maintenance:
\$500
Distribution Method: End user
Number installed to Desc. 25 to 50

(See Vendor Profile Page V-29)

TANDEM COMPUTERS, INC.
HONSTOP TXP
Topology: Double Ring
Network Type: Fiber Optics
Maximum Physical Connections:

Maximum Physical Connections: 255
Maximum Distance: 3,000 Feet Transmiseion Media: Terrestrial Fiber Optics
Access Method: Expand (TM), Fox Protocols Supported: Asynchronous, X.25, HDLC Average Monthly Meintenance: \$500

Distribution Method: End user Number Installed to Date: 25 to 50

TANDEM COMPUTERS, INC.
NONSTOP 1
Topology: Double Ring
Network Type: Fiber Optics
Maximum Physical Connections:
255
Access Method: Expand (TM), Fox
Protocola Supported:
Asynchronus, X.25, HDLC
Average Monthly Maintenance:
\$500
Distribution Method: End user
Number Installed to Dete: 25 to 50

TECMAR, INC. FLAN Topology: Bus (Linear) Metwork Type: Baseband Maximum Physical Connections: 1.024 Maximum Distance: 8,000 Feet Transmission Media: Terrestrial Coaxial Cable Access Mathod: Distributed CSMA/CD (Contention Type) Protocole Supported: Asynchronous, Ascii Hetwork Compatibility: Telenet, Tymnet terfaces Supported: RS-232C, CCITT Advanced Functions Security/Encryption, Diagnostics, Performance Analysis, Usage/Traffic

Purchase: \$1,695 to \$3,395 Average Monthly Meintenence: \$10 Distribution Method: Third-party Number Installed to Dete: 1 to 10 Date First Installed: July 1983 (See Vendor Profile Page V-29)

TELTONE COMP.
DCS-2
Topology: Star
Network Type: Broadband
Meazimum Distance: 18,000 Feet
Transmission Media: Terrestrial
Twisted Wire; Free Space
Microwaves; T-1

Access Method: Centralized PBX (Switching Type) Protocols Supported: Asynchronous, X.25, Blsynchronous, T.1, SDLC, HDLC, Ascill Interfaces Supported: RS-232C Advanced Functions: Diagnostics Price:

Purchase: \$450 Distribution Method: End user Number Installed to Date: Over 100 Date First Installed: 1979 (See Vendor Profile Page V-30)

TRANTOR SYSTEMS LTD. WEB
Topology: Star
Network Type: Broadbard
Maximum Physical Connections: 4
Maximum Distance: 100 Feet
Maximum Oletance: 100 Feet
Transmission Media: Terrestrial
Twisted Wire, RibboryParallel Wire
Access Method: Centralized PBX
(Switching Type)
Protocols Supported: Asynchronous
Network Compatibility: IBM SNA,
Burroughs BHA, XNS (Xerox)
Interfaces Supported: RS-232C,
IEFEF ARR

Security/Encryption, Diagnostics, Usage/Traffic Reporting Average Monthly Maintenence: \$10 Distribution Method: Third-party Number installed to Date: 50 to 100 Date First Installed: June 1983 (See Vendor Profile Page V-31)

Advanced Functions:

UNGERMANN-BASS, INC. NET/ONE BASEBAND NETWORK INTERFACE UNIT Topology: Bus (Linear) Network Type: Baseband Maximum Physical Connections: 1,024 Maximum Distance: 9,184 Feet Transmission Media: Terrestrial

Coaxial Cable, Free Space Infrared

Light
Access Method: Distributed
CSMA/CD (Contention Type)
Protocols Supported:
Asynchronous, Synchronous,
Bisynchronous, SDLC, HDLC, Ascii
Network Compatibility: IBM SNA,
DEC DNA/Decnet, IBM BSA,
DEC DNA/Decnet, IBM BSA,
DEC DNA/Decnet, IBM BSA,
Telenet
IRBAT Sperry DCA, XNS (Xerox),
Telenet
Interfaces Supported: RS-23C,
IEEE 488, CCITT
Advanced Functions: Performance
Analysis, Usage/Traffic Reporting,

Configuration Control Prices: Lease: \$500 Distribution Method: End user, OEM, Third-party Number Installed: July 1980 Date First Installed: July 1980 (See Vendor Profile Page V-32)

UNGERMANK-BASS, INC. NET/ONE BROADBAND NETWORK INTERFACE UNIT Topology: Bus (tree) Network Type: Broadband Maximum Physical Connections: 1,500

Mazimum Dietanota: 10 Miles Transmission Media: Terrestrisi Coaxial Cable Access Method: CSMA Protocole Supported: Asynchronous, Synchronous, Bisynchronous, SDLC, HDLC, Asci Network Competibility: IBM SNA, DEC DNA/Denet, IBM SSC, HOROWARD SECOND, BUTTUIGHS SNA, Sperry DCA, XINS (Xerox), Tielenet Interfaces Supported: RS-232C, IEEE 488, CCITT, DRI W-B Advanced Functions: Performance Analysis, Configuration Control Price:

Lease: \$525 Distribution Method: End user, OEM, Third-party Number Installed to Date: Over 100 Date First Installed: July 1982

UNGERMANN-BAS, INC.
NET/ONE FIBER OPTICS
NETWORK INTERFACE UNIT
Topology: Star
Network Type: Baseband
Maximum Physical Connections:
1,024
Maximum Physical Connections:
1,024
Maximum Distance: 9,184 Feet
Transmission Media: Fiber Optics
Access Method: Distributed
CSMA/CD (Contention Type)
Protocols Supported:
Asynchronous, Synchronous,
Bisynchronous, Spl.C, HDLC, Ascii,
DDCMP
Metwork Compatibility: IBM SNA,
DEC DNA/Decnet, IBM BSC,
Horeywell DSE/DSA, Burroughs
BNA, Sperry DCA, XNS (Kerox),
Teleraet
Interfaces Supported: RS-23C,
IEEE 488, CCITT, Drill W-B
Advanced Functions: Performance
Analysis, Usage/Traffic Reporting,

Lease: \$620
Distribution Method: End user,
OEM, Third-party
UNGERMANN-BASS, INC.

SERIES 600 PRODUCTS

Configuration Control

Topology: Bus (tree)
Network Type: Broadband
Transmission Media: Terrestrial
Cossidal Cable
Access Method: Modems
Protocole Supported:
Asynchronous, Synchronous
Interfaces Supported: RS-232C,
CCTIT
Distribution Method: End user,
DEM, Third-party
Number Installed to Date: 8,100
Date First Intellable: August 1977

WESTERN TELEMATIC, INC. SS-8 Topology: Bus (tree) Topology: Bus (tree) Network Type: Baseband Maximum Physical Connections: 8 Maximum Distance: 1,000 Feet Transmission Media: Terrestrial Twisted Wire, Ribbon/Parallel Wire Access Method: Distributed Token Passing (Poling) Types)

Protocole Supported: Asynchronous Interfaces Supported: RS-232C Advanced Functions: Status Indicator Price:

Purchase: \$895 Distribution Method: End user, OEM, Third-party Number installed to Date: Over 100 Date First Installed: January 1963 (See Vendor Profile Page V-33)

WINNET
Topology: Ring
WINNET
Topology: Ring
Network Type: Broadband
Maximum Physical Connections:
432
Maximum Distance: 2,000 Feet
Transmission Media: Terrestrial
Twisted Wire
Access Method: Distributed
Access Method: Distributed
SNA/CD (Contention Type)
Protecole Supported:
Asynchronous, Synchronous,
Bisynchronous, Asoli
Network Competibility: IBM SNA
Interfaces Supported: R3-432C,
R5-449
Advanced Functions:
Socurity/Encryption, Diagnostics,
UsegelTraffic Reporting
Price:

Prior:
Purchase: \$100
Average Monthly Maintenance: \$1
Distribution Method: End user
Number Installed to Date: Over 100
Date First Installed: November 1982
(See Vendor Profile Page V-33)

XEMOX CORP.
ETHERNET
Topology: Bus (Linear and Tree)
Network Type: Baseband
Maximum Physical Connections:
1,024
Maximum Distance: 2 Miles
Transmission Media: Terrestrial
Coaxial Cable
Distributed
Access Method: Distributed
CSMA/CD (Contention Type)
Protocols Supported:
Asynchronous, Synchronous,
Bisynchronous
Network Compatibility: IBM BSC,
XNS (Xerox)
Interfaces Supported: RS-232C,
X.25
Advanced Functions: Disgnostics,
Reformance Analysis, Usage/Traffic
Reporting
Prios:

Price:
Purchase: \$500 to \$20,000
Distribution Method: Third-party
Number Installed to Date: Over 100
Date First Installed: 1961
(See Vendor Profile Page V-33)

XYPLEX, INC.
XYPLEX SYSTEM
Topology: Bus (Linear)
Network Type: Broadband
Maximum Physical Connections:
255
Maximum Distance: 6 Miles
Transmission Media: Terrestrial
Coaxial Cable
Access Method: Distributed
CSMA(CD (Contention Type)

Reporting

# **Local-Area Networks**

Protocole Supported: Asynchronous Interfaces Supported: RS-232C, RS-422/423, RS-449, CCITT Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic

Price:
Purchase: \$300
Distribution Method: End user
(See Vandor Profile Page V-33)

ZTEL INC. ZTEL LAN Topology: Ring Network Type: Baseband Transmission Media: Terrestrial Twisted Wire, Cosxial Cable, Fiber Optics Access Method: Distributed Token Passing (Polling Types) Protocols Supportad: Asynchronous, Happ, Synchronous, X.25, Bisynchronous, T-1, SDLC, HDLC, Aseil HDLC, Ascii Network Competibility: IBM SNA, DEC DNA/Decnet, IBM BSC. Honeywell DSE/DSA, Burroughs BNA, Primenet, Sperry DCA, XNS (Xerox), HP DSN, Arc Link, Omninet,

Telenet, DDS, Tymnet

Interfaces Supported: RS-232C, RS-449, IEEE 802.5 Advanced Functions: Diagnostics, Performance Analysis, Usage/Traffic Reporting Distribution Method: Third-party (See Vendor Profile Page V-34)

3 COM CORP. ETHERSERIES Topology: Bus (tree) Network Type: Baseband Maximum Physical Connections: 1,024 Maximum Distance: 7,000 Feet

Transmission Media: Terrestrial Coaxial Cable, Fiber Optics Access Method: Distributed CSMA/CD (Contention Type) Protocols Supported: XNS Natwork Compatibility: IBM SNA, VISC (Kern) XNS (Xerox) Interfaces Supported: RS-232C, SNA, X.25 Advanced Functions: Diagnostics, Usage/Traffic Reporting Price:

Purchase: \$950 Distribution Method: Third-party (See Vandor Profile Page V-34)

SOFTWARE

# **Index to Communications Software**

This product category includes software products that are specifically designed to perform communications functions, including teleprocessing monitoring and terminal and network management. The index has been arranged alphabetically by vendor and contains information on the memory required to run the product, the price and the page on which the complete product listing can be found.

VENDOR	MODEL MEMORY REQUIRED	PRICE		PAGE
A. B. Dick Co.	A B DICK COMPANY HASP	\$418		C-21
	A B DICK COMPANY MAGNA SOFTWARE			
	A B DICK COMPANY BIS 3270TM	8400		C. 21
	A B DICK COMPANY BIS 3780TM			
ARW Associator	A B DICK COMPANT BIS 37601M	e+00		0.2
ANT ASSOCIATES	DATA TRANS 48.0K bytes ACCESS 34/36/38			0.21
Access Telecommunications	ACCESS 34/36/38			0-2
Action/Honeywell	6H			
	6l			C-2
Advanced Computer Techniques	ACT NETWORK PROCESSOR			C-2
Advanced Information Management	AIM/FILE CONVERSION SYSTEM			C-2
Advanced Micro Techniques	INTELLIGENT TERMINAL - VERSION 1	\$150		C-2
	MICROTLX - VERSION 1.02			
Advanced Software Products, Inc	3101 EMULATOR	\$300		C-2
Advanced Systems Concepts Inc.	PRISM PROFESSIONAL INTER SYSTEM 512.0K bytes	\$506		Ca
Advanced systems concepts, me	REMOTE PRINTER SUPPORT 1.0M bytes	#1 EOO		0.4
	BATCH EMULATOR 2780/3780/3741			02
Alphamatrix, Inc	BATCH EMULATOR 2780/3780/3741			0.2
Alpha Systems Ltd	ALPHACOMM 64.0K bytes	\$200		C-2
	NUCOMM 64.0K bytes	\$100		C-2
	ALTERGO PRODUCTS SHADOW II 100.0K bytes			
The Alternate Source	TCOM			C-2
	TRAKCESS N/A	\$29		C-2
	TRS-80 COMMUNICATION	\$39		C-2
American Comp. & Size Com.	HASP 990	\$5,000		0.2
Applied Outcomption Inc.	FREEFORM/3000	AI/A		0.0
Appared Cynemetics, Inc.	PHEEFOHM/3000			02
	TERMINAL/3000 N/A ADR/DATACOM/DC - RELEASE 4 N/A	\$2,500	****	C-2
Applied Data Research, Inc	ADR/DATACOM/DC - RELEASE 4	\$13,600 to \$51,500		C-2
Applied Information Systems, Inc	COMMUNICATION SYSTEM-VERSION 2.0 3.0K bytes	\$4,400		C-2
	ARBAT SERIES 700 INTELEX SYSTEM			
Ashton, Inc.	ELECTRONIC MESSAGE SYSTEM 64.0K bytes	\$495		C-2
Aton International, Inc.	MICRO/REMOTE 2780/3780 EMULATOR	\$25,000		C-2
	MICRO/REMOTE 3270 EMULATOR	\$25,000		C-2
Automated Business Canters	COMM-HANDLER	\$296		C-2
	APSTRAN 64.0K bytes			
Automatica Profession systems	THINKER-PC	AUA		0.0
Automation Design, Inc	BARR/HASP 128.0K bytes	ATEC		0.2
Basic Business Control Sys., Inc	ELECTRONIC SCALE POLLING SYSTEM			
	ELECTRONIC TIME CLOCK POLLING SYSTEM 128.0K bytes	N/A		C-2
	VMDS			
	TRIMS			
Bonnecaze, McLeroy & Harrison	VIRTEX 1.0M bytes	\$ \$9,500		C-2
	LINEAR AND MATHEMATICAL PROGRAMMING SYSTEM . 5.1M byte.			
	TRANSIT INFORMATION TRANSFER SERVICES 50.0K byte			
Comey Associates Inc	MSI/TELXON RECEIVE			
Contrary Association, mon	BOSS-3	212 000		0.0
Century Analysis, Inc.	DUSS-3	972,000		0.2
Gincom systems, Inc.	ENVIRON/1	309,400		0-2
	C-N-COMM MICRO/MAINFRAME COMMUNICATIONS 128.0K byte.			
	TELECOMMUNICATIONS			
Comm Pro Associates				
	PP01 48.0K byte.	s N/A		C-2
	PP02	N/A		C-2
	PP03			
	PP04	e M/A		0.0
	VLSW (VIRTUAL LINE SWITCH) 256.0K byte	a		0.4
	VLOW (VIRTUAL LINE SWITCH)	N/A		0.4
Complen Corp				
Compu-Draw	COMCOM 12.0K byts			
	CPMCPM	\$ \$65		C-2
Comp-U-Staff, Inc	BSWIP	\$ \$40.000	)	Ca
	BETA DATA COMM HANDLER			
Computer Comm. Specialists	ACCA I	R N/A	1	C
	400 A W	- 0.014		0.0
	CCS COMMUNICATIONS CONTROL SYSTEM			0.4
Computer Corner	CGS COMMUNICATIONS CONTROL SYSTEM	\$		62

# **Software Index**

NDOR	MODEL MEMORY REQUIRED	PRICE	PA
omouter Information Enterprises	C-F-NETWORK 22.0K bytes CREDIT AUTORIZATION INTERFACE 22.0K bytes SWITCH NETWORK SUPPORT 22.0K bytes	N/A	
	CREDIT AUTORIZATION INTERFACE 22 (IK bytes	N/A	. C
	SWITCH NETWORK SUPPORT 22 OK bules	\$20,000	C
	TELEPHONE PBX SYSTEM	M/A	
amountar Tanthau Inc	INTELLIGINA STOTEM	\$50 to \$250	
surbates, tooloox <sup>2</sup> suo- ·······	INTELLICOM	. 400 10 4200	. 0
	INTELLICOM VER 1.5 INTELLIGENT COMMUNICATIONS . 58.0K bytes	\$49	. C
emputerware Software Unlimited	HAROLD TP MONITOR	\$3,000	. C
amputime, inc	. POINT OF SALES COMMUNICATIONS MANAGEMENT 256.0K bytes	\$30,000	. C
omputronics	INTELLICOM VER 1.5 INTELLIGENT COMMUNICATIONS 56.0K bytes HAROLD TP MONITOR 100.0K bytes POINT OF SALES COMMUNICATIONS MANAGEMENT 256.0K bytes AUTOBAND (AUTOMATIC BAND RATE) 8.0K bytes NETWORK 100.0K bytes MODEM-88 TELECOMMUNICATIONS UTILITY 24.0K bytes CICS-AID 40.0K bytes \$45.574D LEI EVEN 40.0K bytes \$45.574D LEI EVEN 40.0K bytes	\$600	. C
	NETWORK 100.0K bytes	\$1,200	. C
empuview Products	. MODEM-86 TELECOMMUNICATIONS UTILITY	\$89	. C
ompuware Corp	CICS-AID	3,000 to \$8,000	
ontel Information Systems	STAR -ELEVEN N/A INTEGRATED DATABASE MANAGEMENT SYSTEM-DATA N/A	\$4,000	C
illinet Software Inc.	INTEGRATED DATABASE MANAGEMENT SYSTEM DATA N/A	\$50,000	C
S. W Impoint I tel	IMX 200	\$35,000	
- M MANAGEM PROPERTY.	IMX 300	850,000	
	180 OV 5-4	***************************************	
	IMX 700 128.0K bytes CYX-DC DATA COMMUNICATIONS MONITOR 128.0K bytes N/A \$20,	\$150,000	
rirel, inc	. CYX-DG DATA COMMUNICATIONS MONITOR	000 10 \$30,000	
	CYX-RT/IBM REACH THROUGH	1,600 to \$7,000	C
	CYX-RT/IBM REACH THROUGH \$ 50 CYX-TRANSACTION PROCESSING SYSTEM 144.0K bytes \$30, TECTRONICS TERMINAL EMULATOR 512.0K bytes	000 to \$45,000	C
inford Corp	. TECTRONICS TERMINAL EMULATOR	\$1,500	C
talex Co.	PASSPORT-MICRO-TO HOST COMPUTER		
tamark Systems, Inc.	IBM CHANNEL CONTROL UNIT EMULATOR 64 OK bytes	\$5,000	
	LOCAL HIGH SPEED DATA LINK 64 OK bytes \$2	2.000 to \$5.000	
taneint Corn.	ARC 128 OK histor	\$1 600	
	PASSPORT-MICRO-TO HOST COMPUTER 128.0K bytes IBM CHANNEL CONTROL UNIT EMULATOR 64.0K bytes LOCAL HIGH SPEED DATA LINK 64.0K bytes \$1.0CAL HIGH SPEED DATA LINK 64.0K bytes \$1.0CAL HIGH SPEED DATA LINK 128.0K bytes CHANNEL PRODUCTS DC10, CHIOUR, MLCI 128.0K bytes	@1,000	
According to the second	CHANNEL PRODUCTS DC10, CHIOUR, MLCI	\$1,500	5
temport, mo	. TELE-TALK	\$49	
ita Technology Industries	CONTE N/A	\$175	0
e Datelex Co., Inc	PASSPORTS SYSTEM	\$500	0
CA/TAC	CONTE		0
	FT78	\$1,195	(
	IBMA INTERFACE SOFTWARE 64 OK hydros	\$1 195	-
Soro Software Systems, Inc.	IRMA INTERFACE SOFTWARE 64.0K bytes AUTOMATIC NETWORKING OPTION 96.0K bytes	\$5,000	
alta Svetome Inc	WALTE BOY DOWN CADED	A//A	
be Bestel Course	OCCUPATION OF COMPLETE CONTROL OF CALL AND CON	eron	
se measur monb	WHITE BOX DOWNLOADER ORS VERSION 1 25.0K bytes LOCAL AREA NEWORK OPERATING SERVER 8.0K bytes		6
	LOCAL AREA NETWORK OPERATING SERVER 8.0K bytes	\$100	6
	SOFTWARE HANDLER 64.0K bytes		6
iks Co., Inc	DEC DV11 SYNCHRONOUS COMMUNICATIONS HANDLER 12.0K bytes		(
veibles Corp	SUP YWARIE HANDLER SOMMUNICATIONS HANDLER 12.0K bytes DEC DV11 SYNCHRONOUS COMMUNICATIONS HANDLER 12.0K bytes SINGLE BIT HEXADECIMAL SYSTEM 2.0K bytes REMOTT 16.0K bytes ANDMS ADVANCED NETWORK DESIGN 40.0K bytes NDMS NETWORK DESIGN AND MANAGEMENT SYSTEM 160.0K bytes NETWORKER 300.0K bytes \$10.0K bytes STEW ORKER \$10.0K bytes \$10	\$250	(
L. MacNell Engineering	REMOTT 16.0K bytes	\$450	(
MW Group	ANDMS ADVANCED NETWORK DESIGN	\$12,000	6
	NDMS NETWORK DESIGN AND MANAGEMENT SYSTEM 160.0K bytes	\$6.500	(
	NETWORKER 300 0K bytes \$10	000 to \$50 000	-
	TELECOST 200 OK bytes	\$22,000	
	TELECOST 200.0K bytes TOP TELETRAFFIC OPTIMIZER PROGRAM 300.0K bytes \$20.0K	000 to \$40,000	;
LM Missa Bradusta Isa	DISK TRANSFER 48.0K bytes 48.0K bytes	0100 10 440,000	
and mileto Products, inc.	TELETADI		
m't Ask Computer software	TELETARI 32.0K bytes METERED UTILITY MONITORING SYSTEM 36.0K bytes		!
ixbury Systems, Inc	METERED UTILITY MONITORING SYSTEM 36.0K bytes	\$175	(
mamic Microprocessor Assoc	ASCOM 32.0K bytes	\$175	1
mamic Sciences	COSMO 32.0K bytes		1
T Computer Systems, Inc	MESSAGE-SWITCHING AND CONTROL SYSTEM 128.0K bytes PAYMENT AND CONTROL SYSTEM PACS 256.0K bytes	N/A	1
	PAYMENT AND CONTROL SYSTEM PACS	\$60,000	1
ca Corp	PAYMENT AND CONTROL SYSTEM PACS 256.0K bytes FAIL OVER PACKAGE N/A BSC/DV. 96.0K bytes COLINIK 06.0K bytes	\$50,000	1
rans Griffiths and Hart, Inc	BSC/DV 96.0K bytes	\$5.000	
	DEALUP 96.0K bytes TAM 96.0K bytes	\$1,700	
	TAM OF OV budge	ee 000	
rannon Canadilan Inc	. QUICK-TUBE	\$0,000	
res Coffware Inc.	. TERMEXEC		
The control of the	. STANDARD & CUSTOM MICROBASED COMPUTER SUPPLY N/A		!
dion & Associates Inc			(
allon & Associates, Inc.	LOCAL LOCAL	\$150	
rox Microsystems, Inc.	LOGON 128.0K bytes		1
illon & Associates, inc	LOGON 128.0K bytes COM/1 22.0K bytes	\$2,395	
ilion & Associates, inc. rox Microsystems, inc. rosign Computer Co. rrmula Consultants inc.	LOGON         128.0K bytes           COM/1         22.0K bytes           MESSAGE MANAGEMENT SYSTEM MMS-110         N/A	\$2,395 \$30,000	1
ilion & Associates, inc. irox Microsystems, inc. resign Computer Co. iroxula Consultants Inc.	LOGON         128.0K bytes           COM/I         22.0K bytes           MESSAGE MANAGEMENT SYSTEM MMS-110         N/A           SUPER-SYNCHRONOUS UTS PROTOCOL         48.0K bytes	\$2,395 \$30,000 \$900	!
ilion à Associates, inc. vox illicrosystems, inc. resign Computer Co. rmula Consultants inc. semma Technology, inc.	LOGON	\$2,395 \$30,000 \$900 \$4,000	
allon & Associates, Inc. rox Microsystems, Inc. realgn Computer Co. rmula Consultants Inc. amma Technology, Inc.	LOGON	\$2,395 \$30,000 \$900 3,000 to \$4,000 4,000 to \$8,500	
allon & Associates, line, serva Microsystems, line, serva Microsystems, line, seeking Computer Co. principle Generalization inc.	LOGON	\$2,395 \$30,000 \$900 \$900 \$4,000 to \$8,500 \$5,000	
alion & Associates, inc. crox Microsystems, inc. realign Computer Co. crowder Consultants Inc. comma Technology, inc. cyterd Bros., inc.	LOGON	\$2,395 \$30,000 \$900 3,000 to \$4,000 4,000 to \$8,500 \$5,000	
allon & Associates, inc. roco illicresystems, inc. rosign Computer Co. princial Concultants Inc. amma Technology, inc. aylord Bros., inc.	LOGON	\$2,395 \$30,000 \$900 3,000 to \$4,000 4,000 to \$8,500 N/A	
arox Microsystems, inc. irealign Computer Co. ormula Concultants Inc	LOGON	\$2,395 \$30,000 \$300 3,000 to \$4,000 4,000 to \$8,500 \$5,000 N/A \$5,000	
arox Microsystems, inc. irealign Computer Co. ormula Concultants Inc	LOGON	\$2,395 \$30,000 \$900 3,000 to \$4,000 4,000 to \$8,500 \$5,000 N/A \$5,000 \$100	
arox Microsystems, inc. irosign Computer Co. ormula Consultants Inc. iamins Technology, Inc. iaylord Bros., Inc.	LOGON	3.500 to \$5.500	
arox Microsystems, inc. resign Computer Co. ormula Consultants Inc. amma Technology, Inc. aylord Bros., Inc.	LOGON	3.500 to \$5.500	
arox Microsystems, inc. irosign Computer Co. ormula Consultants Inc. iamins Technology, Inc. iaylord Bros., Inc.	LOGON	\$3,500 to \$5,500 N/A	

# **Software Index**

NDOR	MODEL	MEMORY REQUIRED	PRICE		P
sorne W. Hallsham & Co., Inc.	XCHANGE-11	N/A	\$99.500		C
& G Engineering	MODEM 8-16	199 AV hutes	\$205		6
ann A. Bosher and Associates	TOV NET	CA OK buden	AI/A		~
enti A. Berber and Associates	TSX-NET	64.0A Dytes	**************************************		-
Hald, Inc.	HASP REMOTE WORKSTATION	400.0K bytes	\$3,000		C
anada Systems Deelgn, Inc	INTERFACE TELDEAR GSS-TERMINAL	96.0K bytes	\$12,000 to \$25,000		C
	TELDEAR	96.0K bytes	\$12,500		C
aphic Software Systems	GSS-TERMINAL				C
allel frac	THE GUILD CATALVET	64 OK hudan	\$250,000		
on Enterprises, Inc.	CUSTOM CDOS I/O DRIVERS	64 OK huton	\$195		1
	MODEM COMMUNICATIONS FOR COOMEN	109 OK butes	2505		7
A Committee Contains	DOO DELLOTE OFFICE 4 OFFICEO	noo 120.01 Dytes	60.500		
k A Computer Systems	MODEM COMMUNICATIONS FOR CROMEN RSS-REMOTE SERIES 1 SERVICES	8.UK Dytes			. 1
rris Corp	HJE HOST	N/A	\$2,600		- 0
	RJE TERMINAL EMULATION	N/A			. 1
maon Systems, Inc	CRTX	42.0K bytes	\$100		-
	CRTXE	42 OK bytes	\$250		4
	REMOTE	N/A	\$80		1
ma Camputos Rominas	REMOTE	AI/A	AVA		1
THE COMPANIE CONTROL	COTA COLUMNA				1
matou Combrito, selatoss' 100' · · · ·	OCTACOMN/940	N/A	\$2,/50		1
uston Engineering Research	TDC 2000 DRIVER	128.0K bytes	\$4,500		
ward W. Sams & Co., Inc	HELLO CENTRALI	48.0K bytes			. 1
rwa Softwara	SMART TERMINAL		\$75		
mter & Ready, Inc.	C INTERFACE LIBRARY (HP)	A/A	\$450		-
	C INTERFACE LIBRARY (MIT)	AI/A	8450		
	C INTERFACE LIBRARY (MIT)	AVA	0450		
	CHIEFITAGE LIBRARY (WHITE SMITHS).				
	PASCAL INTERFACE LIBRARY (HP)	N/A	\$450		
	PL/M INTERFACE LIBRARY	N/A	\$450		
B Corp	. GENTERM	64.0K bytes	\$79		
E Associates, Inc	IDEACOMM 1200 IDEACOMM 3278 IDEANET				
	IDEACOMM 3278	128 OK hytes	\$1 105		
	IDEANET	128 OK butee	6706		
	IDEASHARE	100.00 5-1	0000		
	IDEASHARE	128.0K Dytes	\$595		
Systems, Inc	ACCULINK	128.0K bytes	\$245		
	BIS-3270	128.0K bytes			
	BIS-3780 BIS-HASP BIS-3270 VERSION 4.0	128.0K bytes			
	RIS-HASP	128 (IK hytes	\$995		
	DIC 2270 VEDCION 4.0	EA OK buten	ecos		
dustrial Community Com	. DDCMP 1000	CA OK bytes	80.500		
dustrial Computer Corp	. DDCMP 1000	04.UN Dytes	\$2,500		
romedia Corp	JENNY				
formation Concepts, Inc	. CICS APPLICATION FILE CONTROL	N/A	\$2,500		
formation Management Technologie:	DEDICOM	256 OK hytes	900 000 to 840 000	)	
e intermetion Organization Corp	OCR (OPTICAL CHARACTER READER) INT	ERFACE 256.0K bytes			
e Intermation Organization Corp	OCR (OPTICAL CHARACTER READER) INT	ERFACE 256.0K bytes			
e information Organization Corp	CICS APPLICATION FILE CONTROL DEDICOM OCR (OPTICAL CHARACTER READER) INT WANG VS TO HIGH-SPEED PRINTER	ERFACE 256.0K bytes	\$20,000 to \$40,000		
e intermation Organization Corp	WANG VS TO IBM DISPLAYWRITER		\$4,000		
	WANG VS TO IBM DISPLAYWRITER	256.0K bytes	\$4,000		
Inservices Inc.	WANG VS TO IBM DISPLAYWRITER		\$4,000		
Inservices Inc.	WANG VS TO IBM DISPLAYWRITER		\$4,000		
Inservices Inc.	WANG VS TO IBM DISPLAYWRITER		\$4,000		
Inservices Inc.	WANG VS TO IBM DISPLAYWRITER		\$4,000		
foservices, Inc.	WANG VS TO IBM DISPLAYWRITER WANG VS TO OCR INTERFACE INFOCOMM/INFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIVINE INTELLIGENT TERMINAL (COMMUNICATIO COMMUNICATION LINK	256.0K bytes 256.0K bytes 32.0K bytes T 32.0K bytes 3.2M bytes 12.0K bytes	\$4,000 \$1,000 \$3,500 N/A N/A	) ) ) )	
loservices, Inc.	WANG VS TO IOM DISPLAYWRITER WANG VS TO OCH INTERFACE. INFOCOMM/INFOHOST ANSWER-DB. INFOSOFT NETWORK SYSTEM- MULTI/NE INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK.	256.0K bytes 256.0K bytes 32.0K bytes 32.0K bytes IN SYSTEM) 3.2M bytes 12.0K bytes	\$4,000 \$1,000 \$3,500 N/A N/A \$778	) ) ) ,	
loservices, Inc.	WANG VS TO IOM DISPLAYWRITER WANG VS TO OCH INTERFACE. INFOCOMM/INFOHOST ANSWER-DB. INFOSOFT NETWORK SYSTEM- MULTI/NE INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK.	256.0K bytes 256.0K bytes 32.0K bytes 32.0K bytes IN SYSTEM) 3.2M bytes 12.0K bytes	\$4,000 \$1,000 \$3,500 N/A N/A \$778	) ) ) ,	
loservices, Inc.	WANG VS TO IOM DISPLAYWRITER WANG VS TO OCH INTERFACE. INFOCOMM/INFOHOST ANSWER-DB. INFOSOFT NETWORK SYSTEM- MULTI/NE INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK.	256.0K bytes 256.0K bytes 32.0K bytes 32.0K bytes IN SYSTEM) 3.2M bytes 12.0K bytes	\$4,000 \$1,000 \$3,500 N/A N/A \$778	) ) ) ,	
loservices, Inc.	WANG VS TO IOM DISPLAYWRITER WANG VS TO OCH INTERFACE. INFOCOMM/INFOHOST ANSWER-DB. INFOSOFT NETWORK SYSTEM- MULTI/NE INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK.	256.0K bytes 256.0K bytes 32.0K bytes 32.0K bytes IN SYSTEM) 3.2M bytes 12.0K bytes	\$4,000 \$1,000 \$3,500 N/A N/A \$778	) ) ) ,	
roservices, Inc. roSert Systems, Inc. nevatek Microsystems, Inc. segrated Design Engineering, Inc. telligent Technologies Intl. Corp.	WANG VS TO IOR INSTEATIVE REVANG VS TO OCH INTERFACE. INFOCOMMINFOHOST ANSWER-DB. INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIO. COMMUNICATION LINK. INCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A	256. OK bytes 256. OK bytes 32. OK bytes 32. OK bytes 132. OK bytes 11. OK bytes 12. OK bytes 14. OK bytes 256. OK bytes 256. OK bytes 256. OK bytes 256. OK bytes 15. OK bytes 256. OK bytes 15. OK bytes 15. OK bytes	\$4,000 \$1,000 \$3,500 N/A \$400 \$8,300 \$8,300 \$8,900 \$1,295 \$1,250 to \$4,995	)	
loservices, inc. InSoft Systems, Inc. Incovatek Microsystems, inc. Incovatek Microsystems	WANG VS TO IBM DISPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINIFOHDST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NOR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK	256.0K Dytes 256.0K Dytes 23.0K Dytes ET 32.0K Dytes N SYSTEM 3.2M Dytes 12.0K Dytes 46.0K Dytes 256.0K Dytes 256.0K Dytes 15.0K Dytes 15.0K Dytes	\$4,000 \$1,000 \$3,500 N/A N/A \$775 \$400 \$8,300 \$8,300 \$1,290 \$1,250 to \$4,990 \$5,500	)	
roservices, Inc. roSert Systems, Inc. nevatek Microsystems, Inc. segrated Design Engineering, Inc. selligent Technologies Intl. Corp. terroon Research Corp. terrostrics	WANG VS TO IBM IDSPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIO COMMUNICATION LINK INTELLIGENT TERMINAL (COMMUNICATION COMMUNICATION LINK INTERCOMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCOM 100A TALK COMMUNICATION TALK	256.0K Dylee 255.0K Dylee 255.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 40.0K Dylee 256.0K Dylee 256.0K Dylee 256.0K Dylee 15.0K Dylee 15.0K Dylee	\$4,000 \$3,500 \$3,500 N// \$772 \$400 \$8,300 \$893 \$1,290 \$1,290 \$500 \$500 \$500	)	
roservices, Inc. roSert Systems, Inc. nevatek Microsystems, Inc. segrated Design Engineering, Inc. selligent Technologies Intl. Corp. terroon Research Corp. terrostrics	WANG VS TO IBM IDSPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIO COMMUNICATION LINK INTELLIGENT TERMINAL (COMMUNICATION COMMUNICATION LINK INTERCOMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCOM 100A TALK COMMUNICATION TALK	256.0K Dylee 255.0K Dylee 255.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 40.0K Dylee 256.0K Dylee 256.0K Dylee 256.0K Dylee 15.0K Dylee 15.0K Dylee	\$4,000 \$1,000 \$3,500 N// N// \$772 \$400 \$8,300 \$893 \$1,290 \$1,290 \$1,290 \$500 \$500 \$1,290	)	
roservices, Inc. roSert Systems, Inc. nevatek Microsystems, Inc. segrated Design Engineering, Inc. selligent Technologies Intl. Corp. terroon Research Corp. terrostrics	WANG VS TO IBM IDSPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIO COMMUNICATION LINK INTELLIGENT TERMINAL (COMMUNICATION COMMUNICATION LINK INTERCOMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCOM 100A TALK COMMUNICATION TALK	256.0K Dylee 255.0K Dylee 255.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 32.0K Dylee 40.0K Dylee 256.0K Dylee 256.0K Dylee 256.0K Dylee 15.0K Dylee 15.0K Dylee	\$4,000 \$1,000 \$3,500 N// N// \$772 \$400 \$8,300 \$893 \$1,290 \$1,290 \$1,290 \$500 \$500 \$1,290	)	
loservices, inc. InSoft Systems, inc. Insoft Systems, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering Incorporated Digital Electronics Associated Business Systems, inc. Incorporates, inc. Instance Design Engineering, inc. Incorporates, inc. Incorporate	WANG VS TO IGN IDSPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTINI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSMISSION PACKAGE	256.0K Dylae 255.0K Dylae 255.0K Dylae 32.0K Dylae ET 32.0K Dylae 12.0K Dylae 12.0K Dylae 12.0K Dylae 255.0K Dylae 255.0K Dylae 255.0K Dylae 15.0K Dylae	\$4,000 \$1,000 \$3,500 N/A N/A \$400 \$3,000 \$1,250 \$1,250 \$1,250 \$2,000 \$1,500 \$2,700 \$2,700 \$2,700 \$2,700 \$2,700 \$2,700	)	
loservices, inc. InSoft Systems, inc. Insoft Systems, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering, inc. Incorporated Design Engineering Incorporated Digital Electronics Associated Business Systems, inc. Incorporates, inc. Instance Design Engineering, inc. Incorporates, inc. Incorporate	WANG VS TO IGN IDSPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTINI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSMISSION PACKAGE	256.0K Dylae 255.0K Dylae 255.0K Dylae 32.0K Dylae ET 32.0K Dylae 12.0K Dylae 12.0K Dylae 12.0K Dylae 255.0K Dylae 255.0K Dylae 255.0K Dylae 15.0K Dylae	\$4,000 \$1,000 \$3,500 N/A N/A \$400 \$3,000 \$1,250 \$1,250 \$1,250 \$2,000 \$1,500 \$2,700 \$2,700 \$2,700 \$2,700 \$2,700 \$2,700	)	
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toservices, inc. toservices, inc. toservices, inc. toservices Microsystems, inc. tograted Design Engineering, inc. tolligent Technologies Intl. Corp. tercon Research Corp. termetrics termational Digital Electronics Assocy tybrook Business Systems, inc. typtode Systems  Technologies Assocy typtode Business  Technologies Assocy typtode Business  Technologies Assocy Technologies Assocy Technologies Assocy Technologies Assocy Technologies Intl. Technologies Int. Technologies In	WANG VS TO IBM DISPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERM	256.0K Oylee 255.0K Oylee 255.0K Oylee 32.0K Oylee 32.0K Oylee 32.0K Oylee 32.0K Oylee 32.0K Oylee 32.0K Oylee 32.50 Oylee 32.50 Oylee 32.50 Oylee 32.50 Oylee 32.50 Oylee 32.50 Oylee 40.0K Oylee 40.0K Oylee 40.0K Oylee 40.0K Oylee 64.0K Oylee	\$4,000 \$3,500 \$3,500 \$3,500 \$4,000 \$77* \$4,000 \$8,900 \$1,250 \$1,2	)	
loservices, inc. loSoft Systems, inc. losoft Systems, inc. lograted Design Engineering, inc. ledited Design Engineering, inc. ledited Technologies Intl. Cerp. lerrestrice lerrestrice lerrestrice lerrestrice lystemational Digital Electronics Assoc lystrook Businees Systems, inc. lysteme Data Consultants, inc. lerrestrice lerrestr	WANG VS TO IBM DISPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 1 PC EXPRESS 1 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMINITERM	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 256.0K Dylae 256.0K Dylae 256.0K Dylae 356.0K Dylae 40.0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A \$777 \$400 \$8,303 \$8,303 \$8,303 \$1,250 \$1,250 \$1,250 \$1,200 \$1,200 \$1,200 \$1,200 \$1,00	7	
loservices, inc.  losoft Systems, inc.  losoft Systems, inc.  lograted Besign Engineering, inc.  leiligent Technologies Intl. Corp.  lerrentics  lerrentics  lerrentional Digital Electronics Assocythrook Business Systems, inc.  lystende Business Systems, inc.  lerrentional Digital Electronics Assocythrook Business Systems, inc.  lerrentional Digital Electronics Assocythrook Business Systems  lerrenting Systems  lerrenting Systems  lerrenting Systems  lerrenting Systems	WANG VS TO IOR INTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOT HETWORK VSTSEM - MULTIVIN INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INC COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION EXPRESOR FOR INTERCON 100A EXPRESOR FOR INTERCON 100A TALK COMMUNICATION EXPRESOR FULLESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERIM DATALINK	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 40.0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A \$777 \$400 \$8,303 \$399 \$1,250 to \$4,998 \$1,250 \$1,500 \$1,5	7	
loservices, inc.  losoft Systems, inc.  losoft Systems, inc.  lograted Besign Engineering, inc.  leiligent Technologies Intl. Corp.  lerrentics  lerrentics  lerrentional Digital Electronics Assocythrook Business Systems, inc.  lystende Business Systems, inc.  lerrentional Digital Electronics Assocythrook Business Systems, inc.  lerrentional Digital Electronics Assocythrook Business Systems  lerrenting Systems  lerrenting Systems  lerrenting Systems  lerrenting Systems	WANG VS TO IOR INTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOT HETWORK VSTSEM - MULTIVIN INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INC COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION EXPRESOR FOR INTERCON 100A EXPRESOR FOR INTERCON 100A TALK COMMUNICATION EXPRESOR FULLESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERIM DATALINK	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 40.0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A \$777 \$400 \$8,303 \$399 \$1,250 to \$4,998 \$1,250 \$1,500 \$1,5	7	
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loservices, inc.  losert Systems, inc.  nevatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Technologies Intl. Corp.  tercon Research Corp.  termetrics.  termational Digital Electronics Associated the properties of the propert	WANG VS TO IOR INTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOT HETWORK VSTSEM - MULTIVIN INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INC COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION EXPRESOR FOR INTERCON 100A EXPRESOR FOR INTERCON 100A TALK COMMUNICATION EXPRESOR FULLESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERIM DATALINK	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 40.0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A \$777 \$400 \$8,303 \$399 \$1,250 to \$4,998 \$1,250 \$1,500 \$1,5	7	
loservices, inc. losoft Systems, Inc. legant Technologies Intl. Corp. leron Research Corp. le	WANG VS TO ION ISPLAYWHITER WANG VS TO TO CRINTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INC COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESEWER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMINITERM DATALINK FASTRAN FASTRAN FASTRAN FASTRIN	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.0K Dylae 32.6K Dylae 32.56.0K Dylae 33.0K Dylae 34.0K Dylae 35.0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A \$777 \$400 \$8,300 \$399 \$1,250 to \$4,990 \$1,250 \$1,2	)	
loservices, inc.  novatek Microsystems, inc.  novatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Design Engineering, inc.  telligant Technologies Intl. Corp.  tercon Research Corp.  tercetics  ternetics  ternetional Digital Electronics Assocy  tybrook Businees Systems, inc.  systems Data Consultants, inc.  systems  gist Automation, inc.  ndborgh Systems  nk Systems  gica, inc.  sockinney Systems  sgnum Communications, i.td.	WANG VS TO IOR INSTEATIVE WHITER WANG VS TO OCH INTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOTH INSTEMPLIAN INTELLIGENT TERMINIAL (COMMUNICATIC COMMUNICATION LINK INTELLIGENT TERMINIAL (COMMUNICATIC COMMUNICATION LINK INTELLIGENT TERMINIAL INTELLIGENT TERMINIAL INTELLIGENT TERMINIAL INTELLIGENT TERMINIAL INTELLIGENT TERMINIAL INTELLIGENT TERMINIAL INTELLIGENT INTEL	256. 0K Dylae 256. 0K Dylae 256. 0K Dylae 32. 0K Dylae 33. 0K Dylae 34. 0K Dylae 35. 0K Dylae	\$4,000 \$3,500 \$3,500 \$4,000 \$4,000 \$777 \$4,000 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$2,270 \$1,000 \$3,500 \$3,500 \$1,500 \$1,000 \$3,500 \$1,500 \$1,0	)	
loservices, inc. InSoft Systems, Inc. Insoft Systems, Inc. Incovatek Microsystems, Inc. Inc. Inc. Inc. Inc. Inc. Inc. Inc.	WANG VS TO ION ISPLAYWHITER WANG VS TO TO CRINTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTIMI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION INC COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSINSSION PACKAGE ASTALK UT 200 OMINITERIM DATALINK FASTRAN FASTRAN FASTRAN FASTRIN FASTRAN FASTRIN CICS/SPOOLER CREDICHECK ATLAS CICS/SPOOLER CREDICHECK ATLAS CICS/SPOOLER CREDICHECK ATLAS CREDICHECK ATLAS CICS/SPOOLER CREDICHECK ATLAS ATLAS ATLAS ATLAS CREDICHECK ATLAS C	256. 0K Dylae 256. 0K Dylae 256. 0K Dylae 32. 0K Dylae 11 32. 0K Dylae 12 32. 0K Dylae 13 32. 0K Dylae 14 32. 0K Dylae 15 32. 0K Dylae 15 56. 0K Dylae 15 56. 0K Dylae 15 56. 0K Dylae 15 56. 0K Dylae 15 50. 0K Dylae 16 50. 0K Dylae 17 50. 0K Dylae 18 50. 0K Dylae 18 50. 0K Dylae 18 50. 0K Dylae 19 50. 0K Dylae 19 50. 0K Dylae 10 50. 0K Dylae	\$4,000 \$3,500 \$3,500 N/A N/A N/A \$777 \$400 \$3,303 \$398 \$1,250 to \$4,980 \$2,700 \$1,200 \$3,500 \$1,200 \$3,500 \$1,200 \$1,200 \$1,000 \$100,000 \$	7	
loservices, inc.  novatek Microsystems, inc.  novatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Design Engineering, inc.  telligent Technologies Intl. Corp.  tercon Research Corp.  termetrics  ternational Digital Electronics Assocy  typtrook Business Systems, inc.  sarned-Mahn  ngist Automation, inc.  ndbergh Systems  nk Systems  gica, inc.  acKinney Systems  acKinney Systems  acKinney Systems  approximation, ind.  ackinney Systems  approximation, inc.  ackinney Systems  approximation, inc.  ackinney Systems  ackinney Systems  approximation products Group  Cormanck & Dodde Corn.	WANG VS TO ION ISPLAYWHITER WANG VS TO ION CHITTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINICATION INTELLIGENT TERMINIAL (COMMUNICATIC COMMUNICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT	256.0K Oylee 255.0K Oylee 255.0K Oylee 32.0K Oylee 252.0K Oylee 252.0K Oylee 255.0K Oylee 15.0K Oylee 4.0K Oylee 64.0K Oylee 1.0M Oylee 1.0M Oylee 3.20K Oylee	\$4,000 \$1,000 \$3,500 N/A N/A \$775 \$400 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$2,270 \$1,000 \$3,500 \$1,000 \$3,500 \$1,000 \$2,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$2,000 \$3,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$1,000 \$1,000 \$2,000 \$2,000 \$1,000 \$2,000	7	
loservices, inc.  novatek Microsystems, inc.  novatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Design Engineering, inc.  telligent Technologies Intl. Corp.  tercon Research Corp.  termetrics  ternational Digital Electronics Assocy  typtrook Business Systems, inc.  sarned-Mahn  ngist Automation, inc.  ndbergh Systems  nk Systems  gica, inc.  acKinney Systems  acKinney Systems  acKinney Systems  approximation, ind.  ackinney Systems  approximation, inc.  ackinney Systems  approximation, inc.  ackinney Systems  ackinney Systems  approximation products Group  Cormanck & Dodde Corn.	WANG VS TO ION ISPLAYWHITER WANG VS TO ION CHITTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINICATION INTELLIGENT TERMINIAL (COMMUNICATIC COMMUNICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT	256.0K Oylee 255.0K Oylee 255.0K Oylee 32.0K Oylee 252.0K Oylee 252.0K Oylee 255.0K Oylee 15.0K Oylee 4.0K Oylee 64.0K Oylee 1.0M Oylee 1.0M Oylee 3.20K Oylee	\$4,000 \$1,000 \$3,500 N/A N/A \$775 \$400 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$2,270 \$1,000 \$3,500 \$1,000 \$3,500 \$1,000 \$2,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$2,000 \$3,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$1,000 \$1,000 \$2,000 \$2,000 \$1,000 \$2,000	7	
foservices, inc.  losoft Systems, inc.  novatek Microsystems, inc.  lograted Design Engineering, inc.  lograted Design Engineering, inc.  lolligent Technologies Intl. Corp.  leron Research Corp.  lerontics  lernational Digital Electronics Assocyptrook Business Systems, inc.  leystone Data Consultants, inc.  learned-Makin.  legist Automation, inc.  ndbergh Systems  ink Systems  gista, inc.  soKinney Systems  soKinney Systems  sophum Communications, i.td.  athernatics Products Group.	WANG VS TO ION ISPLAYWHITER WANG VS TO ION CHITTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINICATION INTELLIGENT TERMINIAL (COMMUNICATIC COMMUNICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT TERMINIAL ICOMMINICATION INTELLIGENT	256.0K Oylee 255.0K Oylee 255.0K Oylee 32.0K Oylee 252.0K Oylee 252.0K Oylee 255.0K Oylee 15.0K Oylee 4.0K Oylee 64.0K Oylee 1.0M Oylee 1.0M Oylee 3.20K Oylee	\$4,000 \$1,000 \$3,500 N/A N/A \$775 \$400 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$2,270 \$1,000 \$3,500 \$1,000 \$3,500 \$1,000 \$2,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$3,000 \$1,000 \$1,000 \$2,000 \$3,000 \$3,000 \$1,000 \$1,000 \$1,000 \$2,000 \$1,000 \$1,000 \$2,000 \$2,000 \$1,000 \$2,000	7	
foservices, inc.  novatek Microsystems, inc.  novatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Design Engineering, inc.  telligent Technologies Intl. Corp.  tercon Research Corp.  termetrics  ternational Digital Electronics Assoc  ystrone Data Consultants, inc.  sarned-Mahn  ngist Automation, inc.  ndiborgh Systems  nk Systems  pgics, inc.  acKinney Systems  acKinney Systems  acKinney Systems  acKinney Systems  acKinney Systems  cormack Ac Dodge Corp.  cCormack A Dodge Corp.  cCormack A Dodge Corp.  cDonnell Douglas Automation Co.  CDM Enterprises	WANG VS TO ION ISPLAYWHITER WANG VS TO ION CHITTERFACE INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST ANSWER-DB INFOCOMMINIFOHOST INFOCOMMINIFOHO	256. 0K Dylae 256. 0K Dylae 256. 0K Dylae 32. 0K Dylae 33. 0K Dylae 34. 0K Dylae 35. 0K Dylae 36. 0K Dylae 37. 0K Dylae 38. 0K Dylae	\$4,000 \$1,000 \$3,500 N/A N/A \$400 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$2,270 \$1,000 \$2,270 \$1,000 \$2,270 \$1,000 \$2,500	7	
foservices, inc.  rosert Systems, inc.  nevatek Microsystems, inc.  tegrated Design Engineering, inc.  tegrated Design Engineering, inc.  telligent Technologies Intl. Corp.  termatics.  ternational Digital Electronics Assocy  tystone Data Consultants, inc.  systeme Data Consultants, inc.  systeme Data Consultants, inc.  systeme Data Consultants, inc.  systems  glica Automation, inc.  ndbergh Systems  ndbergh Systems  splica, inc.  acKinney Systems  spmum Communications, Ltd.  sthematics Products Group  Cormack & Dodge Corp.  Connell Douglas Automation Co.  Call Enterprises  spawest Systems, inc.	WANG VS TO ION ISPLAYWHITER WANG VS TO OCH INTERFACE INFOCOMMINFOHOST ANSWER-DB INFOSOFT NETWORK SYSTEM - MULTINI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 2 INTERCON 100A TALK COMMUNICATION EYEROOK FILESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERM DATALINK FASTRAN FASTWIRE CICS/SPOOLER CREDICHECK ATLAS CCM MANUNICATION COMMUNICATION	256.0K Dylae 256.0K Dylae 256.0K Dylae 32.0K Dylae 350.0K Dylae 356.0K Dylae 366.0K Dylae	\$4,000 \$3,500 \$3,500 \$1,000 \$1,000 \$1,000 \$777 \$4,000 \$3,300 \$1,250 \$1,2	7	
foservices, inc.  losert Systems, inc.  nevatek Microsystems, inc.  legrated Design Engineering, inc.  legrated Design Engineering, inc.  legrated Technologies Intl. Corp.  tercon Research Corp.  termetrics  termetrics  termetrics  lementional Digital Electronics Assoc  systems Deta Consultants, inc.  sarned-Mahn  gist Automation, inc.  ndibergh Systems  nk Systems  nk Systems  spica, inc.  acKinney Systems  spinum Communications, Ltd.  sthematica Products Group  Cormsok & Dodge Corp.  Cornsok & Dodge Corp.	WANG VS TO IBM DISPLAYWHITER WANG VS TO IBM DISPLAYWHITER INFOCOMMINIFOHOST ANSWER-DB INFOCOTH NETWORK VSYSTEM - MULTINI INTELLIGENT TERMINAL (COMMUNICATIC COMMUNICATION LINK NCR COMM CLUSTER NET 3270 PC EXPRESS 1 PC EXPRESS 1 INTERCON 100A TALK COMMUNICATION KEYBROOK FILESERVER FILE TRANSMISSION PACKAGE ASTALK UT 200 OMNITERM DATALINK FASTRAN FASTRAN FASTRAN FASTRAN FASTRIN FASTRIN CICKS/SPOOLER CICKS/SPOOLER CHEDICHECK ATLAS  CHEDICHECK	256.0K Dylae 255.0K Dylae 255.0K Dylae 32.0K Dylae 32.5K Dylae 32.0K Dylae 33.0K Dylae 33.0K Dylae 34.0K Dylae 34.0K Dylae 35.0K Dylae 36.0K Dylae 36.0K Dylae 36.0K Dylae 37.0K Dylae 37.0K Dylae 38.0K Dylae 38.	\$4,000 \$1,000 \$1,000 \$3,500 N/A N/A N/A \$777 \$400 \$8,900 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,250 \$1,000 \$51,000 \$51,000 \$75,000	7	
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# **Software Index**

	MODEL MEMORY REQUIRED	PRICE	P
loro/Macro Systems, Inc.	BI-SYNC 128.0K bytes .	\$495	
loven, Inc.	COMM LINE 64.0K bytes .	\$300	
o Micropodoboral Com	2011102	000	
ere Enge Inc	ISMAR1   32.0K bytes   15LETEXT   48.0K bytes   15LETEXT   48.0K bytes   15LETEXT   96.0K bytes   15LEMOTE   16LEMOTE	900	
cro-sparc, swc	ODOCOTALK YOU	2405	
crostur, Inc	CHOSSTALK XVI 96.0K bytes .		
	REMOTE N/A .		
	TRANSPORTER 96.0K bytes .	\$295	!
cro-Systems Software, Inc	BBS-80		
	MICROTERM N/A		1
	QUADROMACK	000 to \$1,000	
dular Integration, Inc.	COMPAK         256.0K bytes           SDLC/HDLC         256.0K bytes	\$500	
and the grant of the control of the	SDLC/HDLC 258 OK hyles	\$1,000	
house Bata Calanana Com	SDLC/HDLC	AI/A	
mark Data sciences Corp	DOC 3741 N/A	AVA	
	EM 3275 N/A MASP/WS 9.6M bytes		
	MASP/WS 9.6M bytes .		
	REMOTE COPY N/A		
nroe Systems For Business	ASCOM +	\$175	
	MONROE BIS-3780 128.0K bytes MONROE BIS-3270 128.0K bytes	\$750	
	MONROE BIS-3270 128 OK hydes	\$750	
	MONROE TTY EMULATOR	202	
	MONROE BIS-HASP	6205	
	MONROE 3270 SNA/SDLC		
	MUNITUE 32/U SNAVSULU		****
untain Computer, Inc	SUPER TALKER         N/A           DEMON         32.0K bytes		
mford Micro Systems	DEMON	\$29	
	TELCOM II	\$69	
	TELECOM I 32.0K bytes		
tional E-F-T, Inc.	TELECOM I 32.0K bytes LINK/1 64.0K bytes	\$20.000	
Honel Micro Broducts, Inc.	MODEM 64 OK hytes	\$40,000	
	SMODEM 84 OK bytes	\$40,000	
	VMODEM	240,000	
	SMODEM         64.0% bytes           XMODEM         64.0% bytes           XMODEM         64.0% bytes           ANS-TRAN         256.0% bytes           BHGS         256.0% bytes		
tional Semiconductor Corp	ANS-TRAN 256.0K Dytes	N/A	
	BHCS 256.0K bytes		
R Comten, Inc.	ACF/NCP 3		
	BHCS         256.0K bytes           ACF/NCP 3         N/A           CNS 2-COMMUNICATIONS NETWORKING SYSTEM         N/A           PD 4-EN-IL AT (N) PD CCESSING         N/A	N/A	
	EP 4-EMULATION PROCESSING N/A MAF 3-3270 MULTIPLE ACCESS FACILITY N/A	N/A	
	MAE 2,2270 MILE TIPLE ACCESS SACILITY N/A	N/A	
	NAT GOZZO MOLTIFLE ACCESS FACILITY	AU/A	
	NTO-NETWORK TERMINAL OPTION	······································	
	SRM 1-SUB AREA ROUTING MANAGER		
	X.25 PUBLIC DATA NETWORK		****
R Corp	SRIM 1-SUB AREA ROUTING MANAGER		
star Systems, Inc	MESSENGER ELECTRONIC MAIL 64.0K bytes		
	3270 CLUSTER EMULATOR SERVER	\$2,000	
	3278 EMULATOR 64.0K bytes	\$200	
	3770 FMULATOR SERVER 64.0K bytes	\$1.000	
	FILE TRANSFER SERVER 64 0K bytes	\$2,000	
or Concretion Systems Inc.	AMCALL 64.0K bytes	£150	
E Custome 14d	HOST COMM 128.0K bytes	6400	
r. oystems, Ltd	3270 BISYNC EMULATOR		
Roort Computer Corp	. 3270 BISYNG EMULATOR 512.0K Dytes		****
	3270 SNA EMULATOR 512.0K bytes		
	3770 SNA FMULATOR 512 0K bytes		
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# Software Index

/ENDOR	MODEL MEMORY REQUIRED			PAGE
Program Resources, Inc.	WANG DEC LINK	9006		C-36
Instead Computer Inc	POITEDM 51 /I IDODADED VEDGION OF 5156 DI LIGHT 100 OF business	6006		0.90
receded computer; me:	POTTERM 79/1 IDCD ARED VERSION OF 7997 DLLIS) 128 OF Indeed	£905		C-36
Donadatas Com	ALTINO DECEMBED VERSION OF 1001 PEDGJ 120.00 Dyles	e75.000		0.36
suadatar Corp	POTTERM 78(UPGRADED VERSION OF 7887 PLUS)   128.0K bytes	275,000		0.30
	AUTOMATED COLLECTION SYSTEM	\$75,000		C-37
	HUME BANKING SYSTEM			C-37
D 10 . O . O . O	MINIHOST 512.0K bytes	\$200,000		C-37
Quality Software, Inc	QS CALL 64.0K bytes	\$195		C-37
	QS SAM         48.0K bytes           MAGIC MAIL         32.0K bytes           SUPER COM         48.0K bytes           REMOTE 990         192.0K bytes		****	C-37
Racet Computers, Ltd	MAGIC MAIL 32.0K bytes	\$150		C-37
NCS (Rozsa Computer Systems), Inc	SUPER COM	\$19,500		C-37
Real-Time Management Inc	REMOTE 990 192.0K bytes	\$12,500		C-37
Redding Group, Inc	ALPACA PLUS	\$500		C-37
	ALPACA-PLUS - VERSION 2.56	\$500		C-37
	ASYNCH 48.0K bytes	\$100		C-37
	ASYNCH - VERSION 3.01	\$100		C-37
	LYNX	\$250 to \$150		C-37
	MICRO E COM			C-37
	ASYNCH - VERSION 3.01 48.0/K bytes LYNX 48.0K bytes MICRO E COM 48.0K bytes MICRO X.25 48.0K bytes			C-37
	SYNCH 2780/3780	\$500		C-36
	SYNCH 2780/3780         48.0K bytes           SYNCH 2780/3780 - VERSION 2.52         48.0K bytes	\$500		C-38
	SYNCH 3270 48.0K bytes SYNCH 3270 - VERSION 1.3 48.0K bytes	\$750		C-38
	SYNCH 3270 - VERSION 1.3	\$750		C-3
Remm Systems, Inc	TELESTAR 64.0K bytes	\$195		C-38
Remote Computing Corp	STRUCH 22/U-VERSION 1.3	\$100		C-3
RGTI Systems Software	3271/DD DEVICE DRIVER	\$2,700		C-38
	RFX-11 VERSION II (FILE TRANSFER UTILITY) 5.0K bytes	\$675		C-38
	SCREENSHARE-11 TERMINAL MONITOR FACILITY N/A	\$1,250		C-31
Rotelcom Data, Inc	SATURN-SPECIAL SERVICES AND TRUNK UTILIZATION . 2.0M bytes			C-3
RTCS	SCREENSHARE-11 TERMINAL MONITOR FACILITY N/A SATURN-SPECIAL SERVICES AND TRUNK UTILIZATION 2.0M bytes PC/ENET VERSION 1.0 128.0K bytes	\$1,700		C-38
RUF Corp.	IMPRS COMMUNICATIONS SOFTWARE 28.0K bytes	\$2.000		C-38
Sensible Software, Inc	TELE-PORTER			C-38
RGS Semiconductors, Corp	DEC VAX COMMUNICATIONS			C-38
	UD 2000 COLBA BUCATIONIC 512 OV budge	A//A		A 40
	152.0K bytes   152.	N/A		C-38
	TELEX PLUX 512 0K bytes	N/A		C-3
	X 25 512 OK bylos	N/A		C-36
Simonn, Inc.	TELECOMM 256 OK bytes	N/A		C.3
	X.25. 512.0K bytes TELECOMMUNICATIONS INTERFACE. 256.0K bytes SERIES 1 POLLER & CREDIT AUTHORIZATION SYSTEM. 64.0K bytes ICOMM. 48.0K bytes ICOMM 48.0K bytes ICOMM 512.0K bytes VIMOS. 41.0K bytes VIMOS. 41.0K bytes VINTEX N// SDM/RPO ELECTRONIC REMOTE PURCHASE 64.0K bytes AR OK bytes	\$14 000 to \$20 000	)	C-31
Amart, Inc.	SERIES 1 POLLER & CREDIT AUTHORIZATION SYSTEM. 64 0K bytes	\$20,000 to \$80,000	)	C-31
Smith Educational Engineering Sycs.	ICOMM 48 OK bytes	\$150	,	C-31
Software AQ of North America, Inc.	COM-PLETE 512 OK hydro	N/A		C-31
Software Clearing House	VIMOS 41 OK bytes	eg 500		C-36
	VIDTEY A/A	\$7,000 to \$17,000		C-36
Software & Communication Concents	SOFTWARE & COMMUNICATIONS CONCEPT N/A	\$100,000	,	C-91
Software Davelonment & Maintenance	SOM/RPO ELECTRONIC REMOTE PLIRCHASE 64 OK huter	\$5,000	,	C-36
Software Davelonment Com	DAGAR DTS-3	6050		C-91
Software Presentes	### ### #### #########################	east		0.9
sortware synamics	CDAICT CA OV bytes	ean		C-31
Roftware Management Systems Inc.	MCDOTALY 199 OV bytes	ean		C-31
The Seftwere Store	CONTONAL TELECOMMUNICATIONIC LITTLETY 22.0K bytes	6450		0.9
Politican Protomo Inc.	5251 MODEL 12 WORK STATION EMULATOR 64.0K bytes	2504		0.3
scrtware systems, Inc	SZST MODEL 12 WORK STATION EMULATOR 04.04 Dytes	#250 to #751		0.3
Rathwarks Inc	SYSTEM 34, 36, 38 EMULATOR TRANSFER N// VIRTUAL TERMINAL FACILITY 512.0K bytes	9350 10 \$750		0.0
Southern Committee Sustains Inc.	ISIS-CP/M	97,300		0.3
Pouthwestern Date Systems, Inc	TOOLEVANDERS II	eat		0.0
southwestern Data Systems, Inc	ASCII EXPRESS II. 48.0K bytes ASCII EXPRESS THE PROFESSIONAL 48.0K bytes	6404	2	0.3
	ONLINE	900		0.4
	D TERM THE PROFESSIONAL 40.0K bytes	6424		0.4
	P-TERM THE PHOFESSIONAL 48.0K Dytes	3730		C-4
	Z-TERM	3100		C-4
Brantonia Comunitaria III	9-0.00   9	\$150		0-4
Spartacus Computers, Inc	AUTODACC 2070TM	015.000		0-4
start systems	AUTUPAGG GZ/UTM	\$15,000 to \$80,000		04
stratus Computer, Inc	3270 EMULATOR FACILITY	\$5,000		C-4
	3270 TERMINAL SUPPORT	\$4,000		C-4
0	No.   No.	\$3,000		C-4
auperaoπ, Inc	1ERM II	\$200		C-4
aystar Corp	GATEWAY 34/38	\$22,000 to \$34,000		C-4
	GATEWAY/370 192.0K bytes	\$ \$16,000	0	C-4
	LODESTAR 34/38	\$ \$40,000	0	C-4
The Systems Center	NETWORK ACCESS SERVICES CORVUS	3 N/A	١	C-4
	GATEWAT/3/1/1 152 OR O/fee.  LODESTAR 94/98 394.0K bytes.  NETWORK ACCESS SERVICES CORVUS 512.0K bytes.  NETWORK ACCESS SERVICES-SERIES/1 M/  NETWORK DATAMOVER M/  SNA ON MICRO COMPUTERS 100.0K bytes.		١	C-4
The Systems Center, Inc	NETWORK DATAMOVER		4	C-4
	SNA ON MICRO COMPUTERS	3 N/A	4	C-4
System & Software, Inc	SNA ON MICRO COMPUTERS         100.0K bytes           NEXUS         N/I           SIM 3278         N/I	\$420	0	C-4
Systems Resources Corp	SIM 3278	\$6,500	0	C-4
Systems Strategies, Inc	. 2780/3780 EMULATOR	\$47,000	0	C-4
	3270 BSC EMULATOR N//	\$85,000	0	C-4

# **Software Index**

/ENDOR	MODEL	MEMORY REQUIRED	PRICE		PAG
Systems Strategies, Inc.	3270 SNA EMULATOR				C-4
	X.25 INTERFACE				C-4
laft Consulting, Inc	TERRALINK	N/A	\$5,000		C-4
fechnico, Inc.	SERIAL FILE TRANSFER PROGRAM	4.0K bytes	\$100		0-4
Tekelen, Inn.	CHAMELEON ASYNC	64 OK bytes	\$1,000		0-4
	CHAMELEON BASIC				
	CHAMELEON BISYNC				C-4
	FRAMEM (FRAME LEVEL EMULATOR)				
	FRANEM				
	SIMP/L				
	SIMP/L (SIMULATOR INTERACTIVE MULTI-PRO	TOCOL) AVA	\$1,000		
	SITREX	64 OV budge	62,000		
	SITREX-PLUS	04.UK Dytes	24 000		C
Telco Research Corp.	GENERAL COST ALLOCATION (GCA)				
leico nesearch Corp	MULTI-NODE TANDEM OPTYMIZER (MTO)				
	THE ACD OPTYMIZER				
	THE OPTYMIZER PLUS	N/A	\$28,600		C-
	TRU DATA RECORDER/POLLER				
elephone Seftware Connection, Inc	ANSWERING MACHINE				
	PHONE SECRETARY II				
	PICTURE TRANSFER PROGRAM	48.0K bytes	\$40		C-
	TELEPHONE TRANSFER II	48.0K bytes			C
	TERMINAL PROGRAM	48 OK bytes	\$40		C
exas Instruments, Inc.	TERMINAL EMULATOR II	N/A	\$50		
	REMCOM				
TTM	TITN X.25 VERSION 1.0	64 OK butos	N/A		C
WW Core	PTWX	9 Ok butes	200		C
new worth	XPTERM				
op Down Systems	INTF 3270				
op Down Systems	TERMINAL MONITOR	256.UK Dytes			
	VTAM 3270				
reneaction Data Systems, Inc	PACKET NETWORK FACILITY				
	STAT-MUX SUPPORT FACILITY				
ransend Corp	TRANSEND I				
	TRANSEND II	N/A	\$149		C
	TRANSEND III	N/A	\$275		C
	TRANSEND PC				C
Inique Automation Products	RJE REMOTE JOB ENTRY SOFTWARE	N/A	\$1.850 to \$2.250		C
•	UAP-LINK				C
	UAP-LINK FILE TRANSFER SOFTWARE	N/A	\$250		
Inlanft System Corp.	B-NET	156 OK hytee	\$400		
injunctive Computing Co.	UCC MBA-MICROCOMPUTER SOFTWARE	256 OK butes	M/A		
ISMA Computer Co	COMMUNICATIONS PACKAGE	64 OV butes	6000		
rema computer co	IBM PC COM.				
for Amburo B Assestatos to-	TAC SOFT	64.UK Dytes			0
nsicorp	VISIANSWER				
	VISITERM				
	HARE/NET				
Winterhalter, Inc	NS3270 AND NS3780	56.0K bytes			C
Ralas Communications Inc.	TRANSLATION EXPRESS	AI/A	\$500	)	C
Linux Communications, Inc	TAP				

A. B. BECK CO.
A. B. DICK HASP
Additional Product Classification:
Communications/TP Monitors
Specific Application: Data
Communications
System Requirements: AB Dick
Magna Writer, CP/Mr. AB Dick Magna
III, CP/Mr. Magna SL, CP/M
Memory Required: 64.0K bytes
Source Code Aresilables No
Purchase Terms: Purchase (license)
- \$418
Date First Installed: March 1985
(See Verdor Profile Pinge V-1)

A. B. DICK CO.
A. B. DICK MAGNA SOFTWARE
Additional Product Classification:
Communications/TP Monitors
Specific Application: Data
Communications/TP Monitors
System Requirements: AB Dick
Magna Witter, CP/M; AB Dick Magna
III, CP/M; AB Dick Magna SL, CP/M
Memory Required: 64.0K bytes
Source Code Arailtable: No
Purchase Termit: Purchase (license)
- \$300
Date First Installed: March 1983

A. B. DECK GO.
A. B. DECK GO.
A. B. DECK BIS 3270TM
Additional Product Classelfication:
Communications/TP Monitors
Specific Application: Data
Communications
System Requirements: AB Dick
Magna Writer, CP/M: AB Dick Magna
II, CP/M: AB Dick Magna
III, CP/M: AB Dick Magna
III, CP/M: AB Dick Magna
Source Language: Assembler
Source Language: Assembl

A. B. BICK CO.
A. B DICK BS 37807M
Additional Product Classification:
Communication(TP Monitors
Specific Application: Data
Communications 2780/3780
Bystem Requirementa: AB Dick
Magna Writer, CP/M; AB Dick Magna
II, CP/M; AB Dick Magna III,
CP/M; AB Dick Magna III,
CP/M; AB Dick Magna
III, CP/M; AB Dick Magna
III, CP/M; AB Dick Magna
III, CP/M; AB Dick Magna
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ABT ASSOCIATES
DATA TRANS
Additional Product Classification:
Communications/TP Monitors
Specific Application: Automatic
Telecommunication and Data
Transfer, Will Run at 300 or 1200
Baud
System Requirements: Apple II+,
Apple DOS
Memory Required: 48.0K bytes
Source Language: Basic
Source Code Areillable: No
Purchase Terms: Purchase (license)

- \$100 Number installed to Date: 1,000 Date First installed: September 1982 (See Vendor Profile Page V-1)

ACCESS
TELECOMMUNICATIONS
ACCESS 34/36/38
Additional Product Classification:
Communications/TP Monitors
Specific Application: Providee
Asynchronous Communication for
IBM System/34, 36, 38
System Regulerements: IBM
System/34, 36, 38: DOS
Source Language: RPG-III,
Assembler
Source Canguage: RPG-III,
Assembler
Source Code Available: No
Purchase Terms: Purchase (iconse)
Number Installed: November 1981
(See Vendor Profile Page V-1)
ACTION/HONEYWELL

8H
Additional Product Classification:
Communications/TP Monitors
Specific Application: Analog
Communications Packager
Specific Industry:
Telecommunications
System Requirements: DG: RTOS
Network Required: 256.0K bytes
Source Language: Assembler
Source Code Availables: No
Purchase Terms: Purchase (Icense)
Number Installect. 1978
(See Vendor Profile Page V-1)

ADVANCED COMPUTER
TECHNICQUES
ACT NETWORK PROCESSOR
Aciditional Product Classification:
Communications/TP Monitors
Specific Application:
Comprehensive Communications
Controller
Specific Industry: Communication
System Requirements: Honeywell
DPS 6, Honeywell Level 6
Source Language: Assembler
Purchase Terms: Purchase (license)
Number Installed: 1981
(See Vendor Profile Page V-1)

ADVANCED INFORMATION
MANAGEMENT
AIM/FILE CONVERSION SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Menu-Driven

Aid for Converting from One Machine to Another System Requirements: IBM 370; IBM 30XX; IBM 43XX Source Language: Cobol Purchase Terms: Purchase (license); Rentia; Lasse Date First Installed: 1982

ADVANCED MICRO

TECHNIAUES
INTELLIGENT TERMINAL VERSION 1
Additional Product Classification:
Communications/TP Monitors
Spacific Application: Asynchronous
Communication Package
System Requirements: CPIM,
MPIM
Memory Required: 48.0K bytes
Source Language: Assembler
Source Language: Assembler
Source Termis: Purchase (ilonse)
- \$150
Purchase Termis: Purchase (ilonse)
- \$150
Date First Installed: June 1981
(See Vendor Profile Page V-1)

ADVANCED MICRO
TECHNIQUES
MICROTUL - VERSION 1.02
Additional Product Classificatio
communication/IP Monitors
Specific Application: Converts
Specific Application: Converts
CPIM into Telev/TWX Machine
System Requirements: MP/M,
CPIM
Memory Required: 46.0K bytes
Service A requirement Association

Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$150 Number Installed to Date: 7,600 Date First Installed: 1982

ADVANCED SOFTWARE
PRODUCTS, INC.
3101 EMULATOR
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulates
3101 Terminal
System Requirements: IBM PC
Memory Required: 128.0K bytes
Source Code Available: No
Purchase Terms: Purchase (license)
- \$300
Bute First Installed: 1982
(See Vendor Profile Page V-1)

ADVANCED SYSTEMS

CONCEPTS, INC.
PRISM PROFESSIONAL INTER
SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulates IBM
3276 Wth 3278 Model 2 Display
Station Intersystem Communications
Via Tasks
System Requirements: DEC
Professional 300, P/OS
Memory Required: 512.0K bytes
Source Language: Basic
Source Code Available: No
Purchase Terms: Purchase (license)

Number installed to Date: 120 Date First Installed: June 1983 ADVANCED SYSTEMS

COMCEPTS, IMC.
REMOTE PRINTER SUPPORT
Additional Product Classification:
Communications/TP Monitors
Specific Application: Transports,
Cueues and Spools Report to Other
Remote Systems Via Dennet
System Requirements: DEC VAX,
VMS
Memory Required: 1.0M bytes
Source Language: Macro
Source Code Available: No
Purchase Terms: Purchase (license) \$1,500

Number Installed to Date: 1
Date First Installed: June 1983
ALPHAMATRIX, INC.
BATCH EMULATOR
2780/3780/3741
Additional Product Classification:
Communications/TP Monitors
3pecific Application: Stoch File
Transfer from Micro to Mainframe
System Required: 15.0K bytes
Bource Language: Assembler
Number Installed to Date: 600
Date First Installed: 1978
(See Vendor Politie Page V-1)

ALPHA SYSTEMS LTD.

ALPHACOMM
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications Package
System Requirements: Compucorp
600, 700 Series: Zebra
Memory Required: 64.0K bytes
Source Language: Compiled Basic
Purchase Terms: Purchase (icone)
- \$200
Number Installed: 1980
(See Vendor Profile Page V-1)

ALPHA SYSTEMS LTD.
NUCOMM
Additional Product Classification:
Communications/TP Monitors
Specific Application: TTY Terminal
Simulator
System Requirescents: Jacquard
100, 200, 300, 500
Memory Requires: 64.0K bytes
Source Language: Compiled Basic
Purchase Terms: Purchase (license)
- \$100
Number Installed: Date: 5
Date First Installed: 1978

ALTERGO PRODUCTS, INC.
ALTERGO PRODUCTS SHADOW IS
Additional Product Classification:
Communications/TP Monitors
Specific Applications: Full Function
Teleprompter Monitor
System Requirementes: IBM 30XX,
4300: DOS/YSE, OS, VS
Memory Required: 100.0K bytes
Source Language: Assembler

Rental - \$26,000 Number installed to Date: 7,400 Date First Installed: 1975 (See Vendor Profile Page V-1)

### THE ALTERNATE SOURCE TCOM

Additional Product Classification: Communications/TP Monitors Specific Application: Tape-Based Communication: Full Unloading and Downloading nts: TRS-80/3: System Requirements: TRS-80 DOS/80; TRS-80/4: TRS-DOS, DOS/Plus. Multi-DOS Purchase Terms: Purchase (license) Number Installed to Date: 50 Date First Installed: October 1982 (See Vendor Profile Page V-2)

### THE ALTERNATE SOURCE TRAKCESS

Additional Product Classification: Communications/TP Monitors Specific Application: Access Floppy Disk Controller Perform Track I/O System Requirements: TRS-80/I: Multi-DOS: TRS-80/3: DOS/80: TRS-80/4: TRS-DOS, DOS/Plus Source Language: Basic Purchase Terms: Purchase (license)

# Number Installed to Date: 500 Date First Installed: November 1982

THE ALTERNATE SOURCE TRS-80 COMMUNICATION Additional Product Classification Communications/TP Monitors Specific Application: Allows TRS-80 to Talk to Micros and Mainframes Bystem Requirements: TRS-80/I: Multi-DOS; TRS-80/3: DOS/80; TRS-80/4: TRS-DOS, DOS/Plus Memory Required: 32.0K bytes Source Language: Z80 Purchase Terms: Purchase (license)

Number Installed to Date: 1,000 Date First Installed: February 1980

# AMERICAN COMPUTER & ELECTRONICS CORP. HASP 990

**Additional Product Classification:** Communications/TP Monitors Specific Applicatio Communications Link Between TI and IBM Memory Required: 25.0K bytes Source Language: Assemble Source Code Available: No

Purchase Terms: Purchase (license) **Date First Installed: 1981** (See Vendor Profile Page V-2)

### APPLIED CYBERNETICS, INC. FREEFORM/3000

Additional Product Classification: Communications/TP Monitors Specific Applica Communications Interface for HP Terminals Only System Requirements: HP 3000, MPE

Source Language: SPL Source Code Available: No

Number Installed to Date: 34 Date First Installed: 1977 (See Vendor Profile Page V-2)

# APPLIED CYBERNETICS, INC. TERMINAL/3000 Additional Product Classification: Communications/TP Monitors

Specific Application: Communications Interface Between HP 3000 and Non-HP Terminals System Requirements: HP 3000.

Source Language: SPL Source Code Available: No Purchase Terms: Purchase (license); Lease - \$2.500 Number Installed to Date: 34 Date First Installed: 1977

# APPLIED DATA RESEARCH,

ADD/DATACOM/DC - BELEASE 4 **Additional Product Classification:** Communications/TP Monitors Specific Application: TP Monitor System Requirements: IBM Series 370, 30XX: OS. DOS Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license); Rental: Lease - \$13,600 to \$51,500 (See Vendor Profile Page V-2)

### APPLIED INFORMATION SYSTEMS, INC. COMMUNICATION SYSTEM-

VERSION 2.0 Additional Product Classification: Communications/TP Monitors Specific Application: System Requirements: DEC PDP-11 Series, VAX-11 Series. Professional 300 Memory Required: 3.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) Number Installed to Date: 75 Date First Installed: 1974 (See Vendor Profile Page V-2)

### ARBAT SYSTEMS LTD. ARBAT SERIES 700 INTELEX SYSTEM

Additional Product Classification: Communications/TP Monitors Specific Application: Automatic Telex System Specific Industry: Banking/Financial System Requirements: DEC PDP-11; DEC VAX, VMS Memory Required: 512.0K bytes Source Language: Aims Basic Purchase Terms: Purchase (license); Source Code Available: No Number installed to Date: 25 Date First Installed: 1980 (See Vendor Profile Page V-2)

### ASHTON, INC. **ELECTRONIC MESSAGE SYSTEM** Additional Product Classification: Communications/TP Monitors Specific Application: Simulate Electronic Mail Center and Remote System Requirements: IBM PC:

MS-DOS; Apple III: DOS Memory Required: 64.0K bytes Source Language: Basic Purchase Terms: Purchase (license) \$495

Number Installed to Date: 10 Date First Installed: February 1983 (See Vendor Profile Page V-3)

### ATON INTERNATIONAL INC. MICRO/REMOTE 2780/3780

EMULATOR Additional Produ ct Cine Communications/TP Monitors Specific Application: Allows Micro or Minicomputer to Emulate IBM 2780 or 3780 Remote Batch Terminals

System Requirements: CP/M Memory Required: 24.0K bytes Source Language: C Purchase Terms: Purchase (license) \$25 000

Date First installed: November 1982 (See Vendor Profile Page V-3)

# ATON INTERNATIONAL, INC. MICRO/REMOTE 3270 EMULATOR Additional Product Classification: Communications/TP Monitors

Specific Application: Emulates IBM 3275 Interactive Data Terminal Using Bisynchronous Protocol System Requirements: Unix, CP/M Memory Required: 24.0K bytes Source Language: C Purchase Terms: Purchase (license)

\$25,000 Date First installed: November 1982

# AUTOMATED BUSINESS

CENTERS
COMM-HANDLER
Additional Product Classification: Communications/TP Monitors Specific Application: Remote Communication With Other Computers System Requirements: SWT, Memory Required: 128.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) \$295 Number Installed to Date: 25 Date First Installed: 1982 (See Vendor Profile Page V-3)

# AUTOMATED PROFESSIONAL SYSTEMS

APSTRAN **Additional Product Classification** Communications/TP Monitors Specific Application: Transfers Data Between Various Incompatible File Formats System Requirements: CP/M 80, CP/M 86 MS-DOS PC-DOS Memory Required: 64.0K bytes Source Language: Pascal Source Code Available: No Purchase Terms: Purchase (license) Date First installed: September

# (See Vendor Profile Page V-3) AUTOMATION DESIGN, INC. Additional Product Classification

Communications/TP Monitors Specific Application: Uses IBM PC to Interface With Online Systems System Requirements: IBM PC Purchase Terms: Lease (See Vendor Profile Page V-3)

### BARR SYSTEMS, INC. BARR/HASE

Additional Product Classification Communications/TP Monitors Specific Application: HASP
Multileaving Work Station Package
for The IBM PC System Requirem nta: IBM PC. PC-DOS Memory Required: 128.0K bytes Source Language: Macro Source Code Available: No irchase Terms: Purchase (license)

\$750 Number installed to Date: 20 Date First installed: August 1983 (See Vendor Profile Page V-3)

# BASIC BUSINESS CONTROL SYSTEMS, INC. ELECTRONIC SCALE POLLING

SYSTEM Additional Product Classification: Communications/TP Monitors Specific Application: Sends and Retrieves Data to and from Multiple Electronic Scales Specific Industry: Retail System Requirements: IBM Series 1, EDX; IBM, DOS Memory Required: 128.0K bytes Source Language: EDL, Assembler Source Code Available: No Purchase Terms: Purchase (license) Number Installed to Date: 1 Date First Installed: May 1983 (See Vendor Profile Page V-4)

# BASIC BUSINESS CONTROL SYSTEMS, INC. ELECTRONIC TIME CLOCK

POLLING SYSTEM Additional Product Classification: Communications/TP Monitors Specific Application: Sends and Retrieves Data to and from Intelligent Stand-Alone Electronic Time Clock System Requirements: IBM Series/ 1. EDX

emory Required: 128.0K bytes Source Language: EDL Source Code Available: No Purchase Terms: Purchase (license) Number Installed to Date: 1 Date First Installed: May 1983

# BASS SHEED ASSOCIATES.

VMDS Additional Product Classification: Communications/TP Monitors Specific Application: Connecting Intel Development Stations to Minicomputers for Shared Use System Requirements: HP 1000: RTE; DEC PDP: RSX-11M Source Language: Fortran Source Code Available: No Purchase Terms: Purchase (license) - \$15,000 er installed to Date: 1

Date First Installed: October 1982 (See Vendor Profile Page V-4)

# BENSON C. STONE & ASSOCIATES TRIME

Additional Product Classification: Communications/TP Monitors Specific Application: Telecommunication Resources Improvement System System Requirements: IBM, OS-DOS; Sperry; DEC PDP-11; TRS-80 Memory Required: 64.0K bytes Source Language: Fortran Purchase Terms: Purchase (license); Lease - \$20,000 to \$35,000 Number Installed to Date: 20 Date First Installed: June 1979

# BONNECAZE, MCLERCY & HARRISON VIRTEX Additional Product Classification:

Communications/TP Monitors Specific Application: Communications System Requirements: NCR 8500; Memory Required: 1.0M bytes Source Language: Cobol 74
Purchase Terms: Purchase (license): Rental - \$9,500 Number installed to Date: 145 Date First Installed: May 1979 (See Vendor Profile Page V-4)

# CAP INFORMATION SYSTEMS LINEAR AND MATHEMATICAL PROGRAMMING SYSTEM Additional Product Classification: Communications/TP Monitors

Specific Application: X.25 Software for Equipment Attached to Packet Switching Networks 20, VAX, Tops 20, VMS; Prime 650: Primos; Perkin-Elmer 3200: OS/32 Memory Required: 5.1M bytes Source Language: PL/M-86,

Assembler

Source Code Available: No Purchase Terms: Purchase (license); Rental - \$12,000 Number Installed to Date: 20 Date First Installed: June 1980 (See Vendor Profile Page V-5)

# CAP INFORMATION SYSTEMS TRANSIT INFORMATION TRANSFER SERVICES

Additional Product Class Communications/TP Monitors Specific Applica Communication Between Computers Connected By Racal-Milgo's Planet System Requirements: DEC PDP-11: RSX-11M; DEC VAX: VMS Memory Required: 50.0K bytes Source Language: C, Assembler Purchase Terms: Purchase (license)

# CARNEY ASSOCIATES, INC. MSI/TELXON RECEIVE

Additional Product Class Communications/TP Monitors Specific Application: Receive Data from Hand-Held Entry Devices to Computer

tem Requirements: IBM Series/ 1, EDX

1, EDX Memory Required: 64.0K bytes Source Language: EDX - Series/1 Source Code Available: No Purchase Terms: Purchase (license) . \$3,000

Number Installed to Date: 4 (See Vendor Profile Page V-5) CENTURY ANALYSIS, INC.

BO88-3 **Additional Product Classificat** Communications/TP Monitors Specific Application: Transaction Processor, Data-Entry Monitor and On-Line Program Development System for NCR Mainframe System Requirements: NCR, VRX Memory Required: 256.0K bytes Source Language: Cobol, Neat 3 Source Code Available: No Purchase Terms: Purchase (license) \$12,000

Number Installed to Date: 500 Date First Installed: September

(See Vendor Profile Page V-5)

### CINCOM SYSTEMS, INC. ENVIRON/1

Additional Product Classification: Communications/TP Monitors Specific Application: On-Line Teleprocessing Communication Monitor System Requirements: IBM: DOS. EDOS, OS, MVS Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) \$59,400 (See Vendor Profile Page V-5)

# CISINETWORK C-N-COMM MICRO/MAINFRAME COMMUNICATIONS

Additional Product Classification: Communications/TP Monitors Specific Application: Permits The IBM PC to Upload and Download from An IBM Mainframe, Special Error Checking Protocol Insures Data Integrity

System Requirements: IBM PC, MS-DOS

Memory Required: 128.0K bytes Source Language: Compiled Basic rchase Terms: Purchase (license) - \$400

Date First Installed: June 1983 (See Vendor Profile Page V-5)

# COBE CORP. TELECOMMUNICATIONS

Additional Product Classification: Communications/TP Monitors Specific Application: Communicates With Service Bureau for Inquiry and Input Specific Industry: Banking/Financial System Requirements: Wang 2200 Memory Required: 32.0K bytes Source Language: Basic Source Code Available: No Purchase Terms: Purchase (license) \$2 500 Number installed to Date: 18 (See Vendor Profile Page V-5)

### COMM PRO ASSOCIATES NAS (NETWORK ACCESS SYSTEM)

Communications/TP Monitors ific Application: X.25 Support 3705

rements: IBM 3705. VS; IBM 4705, MVS, VM, MVT Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Lease Number installed to Date: 200 Date First installed: 1977 (See Vendor Profile Page V-6)

# COMM PRO ASSOCIATES

PP01 Additional Product Classification: Communications/TP Monitors Specific Application: Automatic Speed Select System Requirements: IBM 3705: VM; IBM 4705: MVS, VS, MVT Memory Required: 48.0K bytes Source Language: Assembler Source Code Available: Yes Purchase Terms: Lease Number installed to Date: 25 Date First Installed: 1973

# COMM PRO ASSOCIATES

PP02 Additional Product Classification: Communications/TP Monitors Specific Application: Code Conversion (ASCII to 2741) System Requirements: IBM 3705: VM; IBM 4705: MVS, VS, MVT Memory Required: 48.0K bytes Source Language: Assembler Purchase Terms: Lease Number Installed to Date: 25 Date First Installed: 1973

# COMM PRO ASSOCIATES

Additional Product Classification: Communications/TP Monitors Specific Application: PP01 and PP02 Combined System Requirements: IBM 3705: VS; IBM 4705: MVS, VM, MVT Memory Required: 48.0K bytes Source Language: Assembler Purchase Terma: Lease Number Installed to Date: 25 Date First Installed: September

### COMM PRO ASSOCIATES PP04

Additional Product Classification: Communications/TP Monitors Specific Application: Terminal Switching Plus PP03 Features System Requirements: IBM 3705: VS; IBM 4705: MVS, VM, MVT Memory Required: 48.0K bytes Source Language: Assembler Purchase Terms: Lease Number installed to Date: 75 Date First installed: 1983

### COMM PRO ASSOCIATES VLSW (VIRTUAL LINE SWITCH) **Additional Product Classificati** Communications/TP Monitors Specific Application: Switch

Between EP and NPP (PP01-PP04 integrated) System Requirements: IBM 3705, VS: IBM 4705, MVS, VM, MVT Memory Required: 256.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Lease Number Installed to Date: 27 Date First Installed: 1977

# COMPION CORP.

Additional Product Classifics Communications/TP Monitors Specific Application: Network Communications Package That Provides Network Protocol for Interconnecting Computers System Requirements: DEC VAX. VMS

Source Language: C Purchase Terms: Purchase (license) \$15,000 - \$15,000 Number Installed to Date: 25 Date First Installed: 1982 (See Vendor Profile Page V-6)

# COMCOM

Additional Product Classification: Communications/TP Monitors Specific Application: Computer Communication and Terminal Emulator

System Requirements: Osborne: CP/M: Kaypro-II: CP/M: Xerox 820: CP/M Memory Required: 12.0K bytes

Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) Date First installed: February 1982 (See Vendor Profile Page V-6)

# COMPULDRAW

CPMCPM Additional Product Classification: Communications/TP Monitors Specific Application: File Transfer Between Computers System Requirements: Oshome: CP/M: Xerox 820: CP/M: Kaypro-II: Memory Required: 8.0K bytes Source Language: Assembly Purchase Terms: Purchase (license)

# Date First installed: March 1982 COMP-U-STAFF, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Bank Switch Interface, Processor Interface, IBM Based Machine With NCR Electronic Funds Transfer Switch Specific Industry: Banking/Financial System Requirements: IBM 4300: DOS: IBM 303X: OS: IBM 308X: MVS

Memory Required: 512.0K bytes Source Language: Assembler. Macro Source Code Available: No Purchase Terms: Purchase (license) Number installed to Date: 4 Date First installed: 1982 (See Vendor Profile Page V-6)

COMPUTAL SYSTEMS, INC.
BETA DATA COMM HANDLER
Additional Product Classification:
Communications TP Monitors
Specific Application: Data
Communications Package
System Requirements: Burroughs
890: CMS; Burroughs 5900, 1910
Memory Required: 250.0K bytes
Source Code Available: No
Purchase Terms: Purchase (license)
-31,500
Date First Installed: 1979
(See Vendor Profile Page V-6)

COMPUTER COMMUNICATIONS SPECIALISTS, INC. ACCA |

ACCA I Additional Product Classification: Communications/TP Monitors Specific Application: Allows Communication With Hand-Held Asynchronous Terminals System Requirements: IBM Series/1: EDX; IBM PC Memory Requirements: IBM Series/1: EDX; IBM PC Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) Number Installed: 1979 (See Vendor Portile Page V-6)

### COMPUTER COMMUNICATIONS SPECIALISTS, INC. ACCA II

Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows J
Communication With Hand-Held
Asynchronous Terminals, POS
Devices and CPUs
System Requirements: IBM Series/
1: EDX: IBM PC
Memory Required: 128.0K bytes
Source Language: Assembly
Source Code Available: No
Purchase Termis Purchase (Icense)
Number Installed to Date: 5
Date First Installed: 1983

COMPLITER CORMER
CCS COMMUNICATIONS
CONTROL SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Asynchronous
bata Communications, File Transfer,
TErminal Simulation
System Requirements: Osborne 1:
CP/M 2.2
Source Language; 8080 Assembly
Source Code Available: No
Purchase Terms: Purchase (lionse)
- \$79
Date First Installed: July 91-6)

COMPUTER INFORMATION ENTERPRISES C-F-NETWORK Additional Product Classification: Communications/TP Monitors Specific Application: Install Series/1 Using Communication Facilities System Requirements: IBM: EDX Memory Required: 22.00 bytes Source Language: EDL Purchase Terms: Purchase (license) Date First Installed: 1983 (See Vendor Porfile Page V-7)

COMPUTER INFORMATION
ENTERPRISES
CREDIT AUTHORIZATION
INTERFACE
Additional Product Classification:
Communications/TP Monitors
Specific Application: Protocol
Conversion to Interface With NonIBM Sales Control into IBM CICS
Credit Host Package
System Requirements: IBM: EDX
Memory Required: 22.0K bytes
Source Language: EDI.
Purchase Terms: Purchase (icense)
Date First Installed: November 1982

COMPUTER INFORMATION
ENTERPRISES
SWITCH NETWORK SUPPORT
Additional Product Classification:
Communications/TP Monitors
Specific Application: Central
Support for Series/1 and PC Dial-Up
Networks
System Requirements: IBM: EDX
Memory Required: 22.0% bytes
Source Language: EDL
Purchase Terms: Purchase (license)
-\$20,000
Date First Installed: 1981

COMPUTER INFORMATION
ENTERPRISES
TELEPHONE PBX SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Directive PBX
Department Costing and Usage
System Requirements: IBM, EDX
Hemory Required: 2.2 Nb tytes
Source Language: EDL
Purchase Terms: Purchase (ticense)
Date First Installed: 1982

COMPUTER TOOLBOX, INC.
INTELLICOM VER 1.5
INTELLIGENT COMMUNICATIONS
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications and Terminal
Emulation With Data Cauture and

Transmission Capabilities System Requirements: DEC VT180: CP/M; Northstra Advantage: CP/M; IBM PC: PC-DOS Memory Required: 56.0K bytes Source Language: C Purchase Terms: Purchase (license) -349 Number Installed: to Dute: 200 Date First Installed: September

COMPLITERWARE 30FTWARE
UNILIMITED
HAROLD TP MONITOR
Additional Product Cleasification:
Communications/TP Monitors
Specific Application: Generalized
TP Monitor
System Requirements: IBM 370
Sories: DOS; IBM 4500 Series:
DOS/NS, DOS/NSE
Memory Required: 100.0K bytes
Source Language: Assembler
Purchase Terms: Purchase (Icense);
Rental; Lease - \$3,000
Number installed: June 1980
Date First Installed: June 1980
(See Vendor Profile Page V-7)

POINT OF SALES
COMMUNICATIONS
MANAGEMENT
Additional Product Classification:
Communications/TP Monitors
Specific Application: Performs TwoWay Communications Operations
Between POS Devices and IBM
Mainframes
Specific Industry: Retail
System Requirements: IBM: DOS
Memory Required: 255.0K bytes
Source Language: Assembler
Purchase Terms: Purchase (icense)

COMPUTIME, INC.

- \$30,000 Number Installed to Date: 1 Date First Installed: August 1981 (See Vendor Profile Page V-7)

COMPUTRONICS
AUTOBAND (AUTOMATIC BAND
RATE)
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications
System Requirements: Prime,
Primos

Memory Required: 8.0K bytes
Source Language: Fortran, PMA
Purchase Terms: Purchase (license)
- \$600
Number Installed to Date: 40

Number Installed to Date: 40
Date First Installed: August 1977
(See Vandor Profile Page V-7)

COMPUTRONICS
NETWORK
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications bittility Allowing the
Communication Between Prime
Systems With Other Systems
System Requirements: Prime,
Primos
Memory Required: 100.0K bytes
Source Language: Fortran

Source Code Available: No Purchase Terms: Purchase (license) - \$1,200 Number Installed to Date: 75 Date First Installed: December 1978

COMPUVIEW PRODUCTS
MODEN-18
TELECOMMUNICATIONS UTILITY
Additional Product Classification:
Communications/TP Monitors
Specific Application: Networking
OF Microcomputer Mainframe
Access
System Requirements: IBM PC,
CP/M-86, MS-DOS
Memory Required: 24.0K bytes
Source Language: Assembly
Source Code Available: No
Purchase Terms: Purchase (Iconse)
- \$89
Number Installed: October 1982
(See Vendor Profile Page V-7)

COMPUMATE CORP.
CICS-AID
Additional Product Classification:
Communications/TP Monitors
Specific Application: Provide
English Language Diagnostics for
CICS
System Requirements: IBM 370,
43XX, 30XX: MVS, DOS/VS, DOS,

VSI
Memory Required: 40 0K bytes
Source Language: Assembler
Source Code Available: No
Purchase Terms: Purchase (icanse);
Lesse - \$6,000 to \$6,000
Number Installed: to Date: 10
Date First Installed: May 1983
See Vendor Profile Page 14-7)

CONTEL INFORMATION SYSTEMS

STAR - ELEVEN
Additional Product Classification:
Operating Systems, Performance
Messurement, Sysytem Resource
Management, Communications/TP
Monitors
Specific Application: Local-Area
Network

Network System Requirements: DEC PDP 11: RSTS/E, RT-11; DEC VAX: VMS Source Language: Fortran, Macro 11 Purchase Terms: Purchase (license) — \$4.000

Number installed to Date: 150 Date First installed: 1980 (See Vendor Profile Page V-7)

CULLIMET SOFTWARE, INC.
INTEGRATED DATABASE
MANAGEMENT SYSTEM-DATA
Additional Product Classification:
Communications/TP Monitors
Specific Application: Integrated
System of Teleprocessing Functions
System Requirements: IBM 360,
370, 30XX
Source Code Available: No
Purchase Terms: Purchase (license);
Rental - \$50,000
Number Installed: June 1978
Date First Installed: June 1978
(See Vender Profile Page V-8)

CULLINET SOFTWARE, INC. UNIVERSAL COMMUNICATIONS

**Additional Product Classification** Communications/TP Monitors Specific Application: Communications yatem Requirements: IBM 360, 370, 30XX Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license);

Rental - \$40,000 Number installed to Date: 301 Date First Installed: January 1981

C & W INCOTEL LTD.

IMX 200 **Additional Product Classificat** Communications/TP Monitors Specific Application: Store and Forward Message Switching (Conversion) System Requirements: DEC PDP. 11/23, Scams Memory Required: 128.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) - \$35,000 Number installed to Date: 12 (See Vandor Profile Page V-4)

C & W INCOTEL LTD. IMX 300 Additional Product Classification:

Communications/TP Monitors Specific Application: Store & Forward Message Switching (Conversion) System Requirements: DEC PDP. 11/34. Scams Memory Required: 128.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) \$50,000 Number Installed to Date: 48

C & W INCOTEL LTD.

IMX 700 Additional Product Classification: Communications/TP Monitors Specific Application: Store & Forward Message Switching System Requirements: DEC VAX Series, VMS nory Required: 128.0K bytes urce Language: Assembler, Blis Purchase Terms: Purchase (license) - \$150,000 Number Installed to Date: 10 Date First Installed: 1980

CYX-DC DATA COMMUNICATIONS MONITOR

Additional Product Classificati Communications/TP Monitors Specific Application: Data Communications Management System Requirements: DEC PDP-11/24: RSX-11M; DEC VAX: VMS Source Language: Assembler, Cobol

se Terms: Purchase (license); Lease - \$20,000 to \$30,000 Number installed to Date: 30 Date First installed: August 1976 (See Vendor Profile Page V-8)

CYTROL, INC. CVX-RT/DECNET REACH

**Additional Product Classification:** Communications/TP Monitors cific Application: Connect DEC-CYX Systems Via Decnet nta: DEC VAX. em Requireme VMS Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) - \$5,000 Number Installed to Date: 10 Date First Installed: May 1983

CYTROL, INC. CYX-RT/IBM REACH THROUGH Additional Product Classifica Communications/TP Monitors Specific Application: Connect DEC/CYX Systems and IBM stem Requirements: DEC PDP: RSX-11M: DEC VAX: VMS Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) \$4.600 to \$7.000

CYTROL, INC. CYX-RT/IBM REACH THROUGH Additional Product Classification Communications/TP Monitors Specific Application: Connect DEC/CYX Systems and IBM Systems System Rec RSX-11M; DEC VAX: VMS Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) - \$4,600 to \$7,000

Number installed to Date: 20

CYTROL, INC. CYX-TRANSACTION PROCESSING SYSTEM

Number installed to Date: 20

Additional Product Classification: DBMS, Communications/TP Monitors Specific Application: Provides Data Communications Management and Data Base Management for DEC PDP-11 and VAX-Based Systems System Requirements: DEC PDP-11: RSX-11M; DEC VAX: VMS Memory Required: 144.0K bytes Source Language: Assembler, Cobol

Source Code Available: No Purchase Terms: Purchase (license); Lease - \$30,000 to \$45,000 Number Installed to Date: 30 Date First Installed: August 1976

DANFORD CORP. TECTRONICS TERMINAL **EMULATOR** Additional Product Classification: Communications/TP Monitors Specific Application: Terminal Emulator Specific Industry: Engineering System Requirements: Apollo,

Memory Required: 512.0K bytes Source Language: Fortran

Source Code Available: No Purchase Terms: Purchase (license) - \$1,500

Number Installed to Date: 2 Date First Installed: 1983 (See Vendor Profile Page V-8)

DATA INDEX, INC. ZIX - TERMINAL CONTROL SYSTEM Additional Product Classificati Communications/TP Monitors Specific Application: Manages Terminal and Memory Space item Requirements: IBM Series/ 1: EDX

Memory Required: 128.0K bytes Source Language: EDL, Assembly Source Code Available: No Purchase Terms: Purchase (license) \$5,000

Number installed to Date: 3 Date First installed: April 1983 (See Vendor Profile Page V-9)

DATALEX CO. PASSPORT-MICRO-TO HOST COMPUTER Additional Product Classification:

Communications/TP Monitors Specific Application: Communications Package Micro to Host

200, UCSD-p System; TI Professional: PC-DOS, CP/M 86 Professionar: PC-DUS, CI/M 86 Memory Required: 128.0K bytes Source Language: Pascal Purchase Terms: Purchase (license) Number Installed: to Data: 100 Date First Installed: May 1983 (See Vendor Profile Page V-9)

DATAMARK SYSTEMS, INC. IBM CHANNEL CONTROL UNIT **EMULATOR** 

**Additional Product Classification:** Data/File Management, Program Generators/Aids/Application Development Tools, Communications/TP Monitors Specific Application: Front End, Networking, Satellite Communications Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license); Rental; Lease - \$5,000 Number Installed to Date: 50 Date First Installed: 1977 (See Vendor Profile Page V-9)

DAYAMARK SYSTEMS, INC. LOCAL HIGH-SPEED DATA LINK Additional Product Classification Communications/TP Monitors Specific Application: Local-Area Network High-Speed Data Link mory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (licens Rental; Lease - \$2,000 to \$5,000 Number Installed to Date: 28 Date First Installed: February 1981

DATAPOINT CORP.

Additional Product Classification Communications/TP Monitors

Specific Application: Local-Area Network Sector Server Software System Requirements: Datapoint 8800, 6600, 3800: DOS Memory Required: 128.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) \$1,500 Number Installed to Date: 5,000 (See Vendor Profile Page V-9)

DATAPOINT CORP. CHANNEL PRODUCTS DC10. CHIOUR, MLCI

Additional Product Classification: Communications/TP Monitors Specific Application: Direct Attachment to IBM Compatible-Byte Multiplexer Channel for Information Transfer to and from IBM to PCM Host

System Requirements: Datapoint 6600: DOS Memory Required: 128.0K bytes Source Language: Assemble Source Code Available: No se Terms: Purchase (license) - \$1,500

DATASOFT, INC. Additional Product Classification: Communications/TP Monitors Specific Application: Home Communications Specific Industry: Home System Requirements: Atari Source Code Available: No Purchase Terms: Purchase (license)

Number Installed to Date: 9,000 Date First Installed: 1982 (See Vendor Profile Page V-9)

DATA SYSTEMS OF BATON ROUGE

**Additional Product Classification:** Communications/TP Monitors Specific Application: Computer to Computer Communication Software System Requirements: DG: Apple II.

CP/M; IBM PC, MS-DOS; DEC VAX. VMS Memory Required: 48.0K bytes

Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) - \$250 to \$1,395 Number installed to Date: 200 Date First Installed: 1980 (See Vendor Profile Page V-9)

DATA TECHNOLOGY

CONTE Additional Product Classification: Communications/TP Monitors Specific Application: tions Purchase Terms: Purchase (license); Lesse - \$175 (See Vendor Profile Page V-9)

THE DATELEX CO., INC. PASSPORTS SYSTEM Additional Product Class Communications/TP Monitors Specific Application:
Communication System Between
Micros and Maintrames
Specific Industry: Fortune 1000
System Requirements: IBM PC,
UCSD: HP 125; DEC Rainbow
Memory Required: 128.0K bytes
Source Language: Pascal
Purchase Terms: Purchase (license)
- 5500

Number installed to Date: 1,000 Date First installed: 1981 (See Vendor Profile Page V-9)

# DCA/TAG

Additional Product Cleanification: Communications/TP Monitors Specific Application: Fine Transfer Package System Requirements: IBM PC: DOS 1.1/2.0, MDS 150; IBM: VM Mismory Required: 125.0K bytes Source Code Availablet: Victoria Source Code Availablet: Victoria Purchase Terms: Purchase (Icense) Number Installed: Docember 1982 (See Vendor Profile Page V-10)

DCA/TAC

Additional Product Classification: Communications/TP Monitors Specific Application: Allows Text File Transfer System Requirements: IBM PC, MS-DOS; IBM 4300, VM, MVS Memory Required: 128.0K bytes Source Language: C Purchase Terms: Purchase (license) - \$1.195

Number installed to Date: 10,000 Date First installed: September 1963

DCA/TAC

RMA INTERFACE SOFTWARE Additional Product Classification: Communications/TP Monitors Specific Application: Allows You to Talk from One Host Through IBM 3274/76 Control to IBM PC System Requirements: IBM PC: PC-DOS

Milemory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) - \$1,195 Number Installed to Date: 1,000 Date First Installed: 1982

DEFARO SOFTWARE

SYSTEMS, INC. AUTOMATIC NETWORKING OPTION

Additional Product Classification: Communications/TP Monitors Specific Application: Automatic Networking Specific Industry: Retail System Requirements: IBM System/48, System/36 Mismory Required: 96.0K bytes Source Language: RPG-II Purchase Terms: Purchase (license) - \$5,000 Date First Installed: August 1982 (See Vendor Profile Page V-10) DELTA SYSTEMS, INC.
WHITE BOX DOWNLOADER
Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows 2
Computers to Send/Receive Data
from Disk to Disk.
System Requirements: ICL System
10: DMS 2; ICL System 28: DMS 3
Source Cade Arsistables: No
Purchase Terms: Losso
Humber Installed: March 1983
(See Vendor Profile Page 14-10)

THE DESTEK GROUP CENTRAL RESOURCE SERVER CRS VERSION 1

Additional Product Classification: Communications/TP Monitors Specific Application: Resource Sharing Software for Unix Local-Area Network Applications System Requirements: CP/M, PC-DOS, MS-DOS, Unix Memory Required: 25.010 bytes Source Language: C Purchase Terms: Purchase (license) - 5500

Number installed to Date: 15 Date First installed: May 1983 (See Vendor Profile Page V-10)

THE DESTEN GROUP
LOCAL-AREA NETWORK
OPERATING SERVER
Additional Product Classification:
Communications/TP Monitors
Specific Application: Local-Area
Network Software for CPM, PCDOS, MS-DOS, Unix
System Requirements: CPM, PCDOS, MS-DOS, Unix
Memory Required: 8.0K bytes
Source Language: C, Assembler
Purchase Terms: Purchase (liconse)
- \$100
Number Installed to Date: 30
Date First Installed: May 1983

B.O.M.
SOFTWARE HANDLER
Additional Product Ctaselfication:
Communications/TP Monitors
Specific Application: Reads Data
Out Of Cash Register, Creates File
on IBM
Specific Industry: Retail
Specific Industry: Retail
System Requirements: IBM PC, PC-

DOS Memory Required: 64.0K bytes Source Language: Basic Purchase Terms: Purchase (license)

Number Installed to Date: 50 Date First Installed: March 1983 (See Vendor Profile Page V-8)

\$99

DILKS CO., INC.
DEC DV11 SYNCHRONOUS
COMMUNICATIONS HANDLER
Additional Product Classification:
Communications/TP Monitors
Specific Application: Full Polling
Capability With A Priority Output
Scheme
System Requirements: DEC PDP11: DEC VAX, VMS

.

Memory Required: 12.0K bytes Source Language: Fortran 77, Assembly Purchase Terms: Purchase (license); Rerital; Lesse Number Installed: Deta: 1 Date First Installed: September 1982 (See Vendor Profile Page V-10)

DIVELBISS CORP. SINGLE BIT HEXADECIMAL SYSTEM

SYSTEM
Additions Product Classification:
Communications/TP Monitors
Specific Application: Programmable
Controller System Software
System Requirements: Divelbiss
Memory Required: 2.0K bytes
Source Code Available: No
Purchase Termis: Purchase (icense);
Rental - \$250
Number installed to Date: 1,000
Date First installed: June 1982.
(See Vendor Profile Page V-10)

D. L. MACNEIL ENGINEERING REMOTT

Additional Product Classification:
Communications/TP Monitors
Specific Application: Send Or
Receive Source Or Save File from
One Computer to Another
System Requirements: DEC, RT11; DEC, RSX-11
Memory Required: 16.0K bytes
Source Language: Macro
Sourc

DMW GROUP ANDMS ADVANCED NETWORK DESIGN

Additional Product Classification: Communications/TP Monitors Specific Application: Design of Banking (ATM) and Retail (POS) Networks Specific Industry: Retail, Banking/Financial System Requirements: IBM 370, 30XX, 43XX, MVS, TSO, CMS; DEC VAX; Amdail 470, 5880

VAX; Amdahi 470, 5880 Memory Required: 400.0K bytes Source Language: Fortran Purchase Terms: Lesse; Time-Sharing - \$12,000 Number Installed: Dates: 2 Date First Installed: January 1978 (See Vendor Profile Page V-11)

DAIW GROUP NOMS NETWORK DESIGN AND MANAGEMENT SYSTEM Additional Product Classification Communications/TP Monitors Specific Application: Design Management Reporting and

Optimization OF Multistage,

Multipoint Data Communications Networks System Requirements: IBM 360, 370, 30XX, MVS, TSO, CMS; DEC VAX, VMS; Amdahi 470, 5680 Memory Required: 160.0K bytes Source Language: Fortran Purchase Terms: Lease; Timesharing - \$6,500 Date First installed: January 1977

DMW GROUP

NETWORKER
Additional Product Classification:
Communications(TP Monitors
Specific Application: Design of Data
Communications Networks
System Requirements: IBM 370,
300X, 430X, MYS, TSO, CMS; DEC
VAX, VMS; Anderie
Memory Required: 300.0K bytes
Source Code Awalitaties: Not Purchase Terms: Lesse; Timestaring - \$10,000 to \$50,000
Number Installed to Date: 3
Date First Installed: November 1983

DMW GROUP

TELECOST
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Telecommunications Chargeback
and Allocation
System Requirements: IBM 360,
370, 300X, 43X: TSO, CMS, MVS;
DEC VAX: VMS; SO, CMS, MVS;
DEC VAX: VMS; Andaid 470, 5860
Memory Required: 200.0K bytes
Source Language: Cobol
Purchase Terms: Lesse; Timesharing - \$22,000
Number Installed: January 1980

DMW GROUP TOP TELETRAFFIC OPTIMIZER

PROGRAM
Additional Product Classification:
Communications/TP Monitors
Specific Applications Reduces Long
Distance Usage Costs by
Reconfiguration of The Facilities and
Services
System Requirements: IBM 360,
370, 30XX, 43X: MVS, TSO, CMS;
DEC VAX: VMS; Amdishl 470, 5880
Memory Required: 300, 0K bytes
Source Language: Cobol, Fortran
Purchase Terms: Lesse; Timestaring - \$20,000 to \$40,000
Number Installed: January 1979

DAN MICRO PRODUCTS, INC. DISK TRANSFER

Additional Product Classification:
Communication/TP Monitors
Specific Application: Utility Program
to Transfer OSI CP/M Format Disk to
Standard CP/M IBM 3740 Format
System Requirements: Chio
Scientific: CP/M 2.2
Memory Required: 48.0K bytes
Source Code Arallebile: No
Purchase Terms: Purchase (license) - 3100

Date First Installed: January 1983
DON'T ASK COMPUTER
SOFTWARE
TELETAR!
Additional Product Classification:
Communications/TP Monitors

Specific Application:
Telecommunications Package
System Requirements: Atari: DOS
Memory Requirem: 32.0K bytes
Seurce Language: Machine
Source Code Arraillable: No
Purchase Terms: Purchase (icense) - 34.0
Date First Installed: January 1983
(See Vendor Profile Pace V-11)

DUXBURY SYSTEMS, INC.
METERED UTILITY MONITORING
SYSTEM
Additional Product Classification:

Addragons Product Classification: Communications/TP Monitors Specific Application: Communications System Requirements: Northstar Horizon: DOS; Northstar Advantage: DOS Memory Required: 36.0K bytes Source Language: Northstar Basic Source Code Arellables: Northstar Basic Source Code Arellables: Northstar Basic

Purchase Terms: Purchase (license) - \$175 Number Installed to Date: 5 Date First Installed: January 1982 (See Vendor Profile Page V-11)

DYNAMIC MICROPROCESSOR ASSOCIATES ASCOM

Additional Product Classification:
Communications/TP Monitors
Specific Application: Asynchronous
Communication Package
System Requirements: CP/M, CP/M
86, MS-DOS, PC-DOS
Memory Required: 32.0K bytes
Source Code Availables: No
Purchase Terms: Purchase (license) Surbar Installed: January 1379
Number Installed: January 1379
Signovar Code (See Vendor Profile Page V-11)

DYNAMIC SCIENCES

COSMO
Additional Product Classification:
Communications/TP Monitors
Specific Application: Complete
Monitoring and Control System
System Requirements: DEC PDP11, RSX-11k: HP, RTE: DEC PDP11, RSTS/E
Memory Required: 32.0K bytes

Source Language: Fortran
Purchase Terms: Purchase (license)
Number Installed to Date: 5
Date First Installed: 1979
(See Vendor Profile Page V-11)

EFT COMPUTER SYSTEMS,

MESSAGE-SWITCHING AND CONTROL SYSTEM Additional Product Classification: Communications/FI Monitors Specific Application: Message Switching and Control System Specific Industry: Banking/Financial System Requirements: NCR 9040, 9050, 3900; IBM System/34; IBM System/36; IBM Syst

Date First Installed: 1983 (See Vendor Profile Page V-11)

EFT COMPUTER SYSTEMS, INC. PAYMENT AND CONTROL

SYSTEM PACS
Additional Product Clearification:
Banking, Data/Filo Managament,
Communications/TP Monitors
Specific Application: Paying and
Receiving Money Transfers
Specific Application: Paying and
Receiving Money Transfers
Specific Industry: Banking/Financial
System Requirements: NCR 9040,
9050, 9300; IBM Systems/S
Memory Required: 256.0K bytes
Source Language: Cobol
Purchase Terms: Purchase (license)
- \$60,000
Number Installed: Date: 4
Date: First Installed: 1977

ESCA CORP.
FALL OVER PACKAGE
Additional Product Classification:
Communications/TP Monitors,
Redundant CPUs
Specific Application: Redundant
CPUs Networking Package
Specific Industry: Engineering,
Scientific
System Requirements: DEC VAX11780. VMS: DEC VAX-11750.

VMS; DEC VAX-11/782, VMS Source Language: Fortran, Macro Purchase Terms: Purchase (license) - \$50,000 Number Installed: to Date: 5 Date First Installed: 1983 (See Vendor Profile Page V-11)

EVANS GRIFFITHS AND HART, INC.

BSC/DV
Additional Product Classification:
Communications/TP Monitors
Specific Application: Driver for DEC
DPP-11 Handles Most BSC-Based
Protocols
System Requirements: DEC PDP,
RSTS/E

Memory Required: 96.0K bytes Source Language: Macro-11 Purchase Terms: Purchase (license) - \$5,000 Number installed to Date: 9 Date First installed: 1978 (See Vendor Profile Page V-11)

EVANS GRIFFITHS AND HART, INC. COLINK

Additional Product Classification:
Communications/TP Monitors
Specific Application: Links Two
RISTS/E Systems
Systems Requirements: DEC PDP11, RSTS/E
Memory Required: 98.0K bytes
Source Language: Basic
Purchase Terms: Purchase (license) 51.250

EVANS GRIFFITHS AND HART, INC. DEALUP

Date First installed: 1979

Additional Product Classification: Communications/TP Monitors Specific Application: Link for RSTS/E System to A Remote Computer Using Asynchronous Terminal Line System Requirements: DEC PDP, RSTS/E

Memory Required: 96.0K bytes Source Language: Basic Number Installed to Date: 59 Date First Installed: 1979

EVANS GRIFFITHS AND HART, INC. TAM

TAM
Additional Product Classification:
Communications/TP Monitors
Specific Application: TransactionProcessing Front End for the PDP-11
System Requirements: DEC PDP11: RSTS/E, RSX-11M; DEC VAX,
VMS

Memory Required: 96.0K bytes Source Language: Basic, Macro-11 Purchase Terms: Purchase (license) - \$6,000 Number Installed to Date: 93

Number Installed to Date: 93 Date First Installed: 1975

EVERGREEN CONSULTING, INC. OUICK-TURE

Additional Product Classification: Communications/TP Monitors Specific Application: TSO System Requirements: IBM: OS/MVS

Source Language: Assembler Purchase Terms: Rental; Lease -\$650

Number Installed to Date: 123 Date First Installed: May 1978 (See Vendor Profile Page V-12)

EXEC SOFTWARE, INC.

TERMEXEC
Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows An Apple III + or Apple III to Operate As An Intelligent Terminal on A Variety Of Host Systems
System Requirements: Apple III+: Pro-DOS, DOS 3.3
Memory Required: 48.0K bytes
Source Language: Assembly
Purchase Terms: Purchase(license)

- \$80 Number installed to Date: 200 Date First installed: January 1983 (See Vendor Profile Page V-12)

FALLON & ASSOCIATES, INC. STANDARD & CUSTOM MICROBASED COMPUTER SUPPLY

SUPPLY
Additional Product Classification:
Communications/TP Monitors
Specific Application: SNA, X.25
DCE, X.25 DTE, IBM 3270, 3780
BSC, Asynchronous, X.3,
Asynchronous VIP 7700, IBM 3270
Emulation Protocols
Specific Industry:
Telecommunications
Source Language: Pascal,
Assembler

Purchase Terms: Purchase (license) Number installed to Date: 200 Date First Installed: May 1981 (See Vendor Profile Page V-12)

FEROX MICROSYSTEMS, INC. LOGON Additional Product Classification:

Additional Product Casesification:
Communications/TP Monitors
Specific Application:
Specific Application:
Communication Package Allows
Storage Of Configurations and
Prione Numbers
Specific Industry: Banking/Phancial
System Requirements: IBM PC,
UCSD-P System: MS-DOS; Apple II:
Apple-DOS
Memory Required: 128.0K bytes
Source Language: Psacal
Source Code Available: No
Purchase Terms: Purchase (license)

- \$150 Number Installed to Date: 500 (See Vendor Profile Page V-12)

FIRESIGN COMPUTER CO.

Additional Product Classification: Communications/TP Monitors Specific Application: File Transfer With IBM 2780 OR 3780 Compatible Devices System Requirements: IBM Series/

System Requirements: IBM Series/ 1, EDX Memory Required: 22.0K bytes Source Language: EDL Purchase Terms: Purchase (license) - \$2.395

Number Installed to Date: 12 Date First Installed: 1976 (See Vendor Profile Page V-12)

FORMULA CONSULTANTS,

MESSAGE MANAGEMENT
SYSTEM MMS-110
Additional Product Classification:
Communications/TP Monitors
Specific Application: Sends
Messages from Terminal to Terminal
System Requirements: Sperry
1100, S 1100
Source Language: Cobol,
Assemblar
Purchase Terms: Purchase (Icense);
Rental: Lesse - \$30,000
Date First Installed: July 1980
(See Vender Profile Page V-12)

FORMULA CONSULTANTS,

INC.
SUPER-SYNCHRONOUS UTS
PROTOCOL
Additional Product Classification:
Communications/TP Monitors
Specific Application: Sperry
Terminal Emulation
System Requirements: Xerox 860:
CPM
Memory Required: 48.0K bytes
Source Language: Assembler
Purchase Terms: Purchase (loonse)

Number installed to Date: 10 Date First Installed: June 1982 GAMMA TECHNOLOGY, INC. GAMMA TECHNOLOGY WORKSTATIONS

\$900

WORKSTATIONS
Additional Product Classification:
Communications/TP Monitors

Specific Application: Protocol
Emilation
System Requirements: DG:
AOS/NS: DG MW Series: RTOS; DG
Nova: RDDS
Memory Required: 32.0K bytes
Source Language: Assembly for TV
Source Code Available: Yes
Purchase Terms: Purchase (license)
- \$3,000 to \$4,000
Number Installed to Date: 429
Date First Installed: 1976
/See Vendor Profile Page V-12)

GARRRIA TECHNOLOGY, INC.
GITTO CENTRAL SITE GTTO
Additional Product Classification:
Communications/TP Monitors
Specific Application: 3270
Communication
System Requirements: DG Eclipse:
AOS; DG Nove, R-DOS, RTOS
Memory Required: 32,0K bytes
Source Language: Assembly for TV
Purchase Terms: Purchase (iconse)
-\$4,00 to \$8,500
Number installed to Dele: 5
Dete First Installed: 1976

DIAL-I/P BIGUIRY
Additional Product Classification:
Communications/TP Monitors
Specific Application: One or More
Dial-up Ports to Exist On the GS1000, 2000
Specific Industry: Library
System Requirements: Apple II+
Memory Required: 48.0K bytes
Source Language: Basic
Purchase Terms: Purchase (license)
- \$5,000
(See Vendor Profile Page V-12)

**GAYLORD BROS., INC.** 

CAYLORD BROS., INC.
G8-500 MICRO COMPUTER
NETWORK SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Has All
Features OF G8-1000, Combines
On-Line and Stand-Alone Processing
System Requirements: Apple II+
Memory Required: 48.0K bytes
Source Language: Basic
Purchase Terms: Purchase (lionse)

QAYLORD BROS., INC.
OCLC INTERFACE
Additional Product Classification:
Communications/TP Monitors
Specific Application: Direct Transfer
of an Edited Marc II Record On The
OCLC

Specific industry: Library System Requirements: Apple II + Memory Required: 48.0K bytes Source Language: Basic Purchase Terms: Purchase (license) - \$5,000

GAYLORD BROS., INC.
VISI TERM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Enables Apple
Il to Communicate With Larger
Computers or Other PCs
System Requirements: Apple II+

Memory Required: 48.0K bytes Source Language: Basic Purchase Terms: Purchase (license) - \$100 Data First Installed: 1900

**GEJAC, INC.** HASP VERSION 3

Additional Product Classification: Communications/TP Monitors Specific Application: Communications Specific Application: System Requirements: DEC VAX-11: VMS; DEC PDP-11: RSX, IAS, RT-11 Memory Required: 16.0K bytes Source Language: Assembler, Fortran Source Language: Assembler, Fortran Rental; Lease - \$3,500 to \$5,500 Number Installied: January 1978 (See Vendor Profile Page V-12)

QEMASYS CORP.
TELIOS
Additional Product Classification:
Communications/TP Monitors
Specific Application: Asyncronous
Telecommunications Handler for IBM PC
System Requirements: IBM PC:

DOS 2.0 Memory Required: 96.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) Number Installed to Date: 50 Date First Installed: January 1905 (See Vendor Profile Page V-12)

GENERAL DIGITAL

INDUSTRIES, IMC.
COMPAT/200
Additional Product Classification:
Communications/TP Monitors
Specific Application: User 200
Workstation Emulator for
Communication With CDC Cyber
Systems
System Requirements: DEC: Unix
Memory Requires: 256.0K bytes
Source Language: C
Purchase Terms: Purchase (license) - 53,000
Number Installed: January 1982
(See Vendor Profile Page V-13)

GENERAL BLECTRIC
HIFORMATION
TSI2.0
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communication Software
System Requirements: IBM PC:
MS-DOS
Memory Required: 100.0K bytes
Source Language: Fortran
Purchase Terms: Purchase (icense)

- \$250 Date First Installed: October 1982 (See Vendor Profile Page V-13)

GEORGE W. HALLAHAM & CO., INC. XCHANGE-11 Additional Product Classification:

Communications/TP Monitors Spacific Application: Micro Computer Communication and Networking System Requirements: DEC PDP-11: RSTS/E: DEC VAX: RSX-11M Source Language: Basic Source Code Available: Yes Purchase Terms: Purchase (Bonse; - \$99,500 Number Installed: May 1982 Number Installed: May 1982 (See Vendor Profile Page V-13)

G & G ENGINEERISM
MODEM 8-15
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Telecommunication Language for
MP/M 86 System and for Concurrent
CP/M 86
System Requirect: 128.0K bytes
Source Languages: C
Source Code Available: No
Purchase Terms: Purchase ((iconse)

- \$295 Number Installed to Date: 85 Date First Installed: January 1983 (See Vendor Profile Page V-12) QLENN A. BARBER AND

TSX-NET
Additional Product Classification:
Communications/TP Monitors
Specific Application: Networking
Package
System Requirements: DEC, RT11,
TSX Plus, RSX 11, DEC VAX: VMS
Memory Required: 64.0K bytes
Purchase Terms: Purchase (iconse)

(See Vendor Profile Page V-13)

GOULD, INC.
HASP REMOTE WORKSTATION
Additional Product Classification:
Communications/TP Monitors
Specific Application: Remote Job
Entry
System Requirements: Concept/32,
MPX-32

Memory Required: 400.0K bytes Purchase Terms: Purchase (license) - \$3,000 (See Vendor Profile Page V-13)

GRANADA SYSTEMS DESIGN, INC. INTERFACE

INTEMPACE
Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows Host to
Communicate With Multiple Hosts
Specific Industry: Banking/Financial
System Requirements: BM Series/
1, EDX
Memory Required: 98.0K bytes

Memory Required: 96.0K bytes Source Language: EDL Number Installed to Date: 6 Date First Installed: July 1982 (See Vendor Profile Page V-13)

GRANADA SYSTEMS DESIGN, INC. TELDEAR Additional Product Classification: Communications/TP Monitors
Bpecific Application: Telephone
Data Erray and Audio Response,
Touch-Tone, Order Erray, Pay-ByPhone Sales Order Erray, Pay-ByPhone Sales Order Erray,
Bpecific Industry:
Wholessia/Distribution,
Banking/Financial
Bystem Regulerements: IBM Series/
1: EDX; IBM System/38, System/38;
SSP
Memory Required: 96.0K bytes
Source Language: EDL
Purchase Terms: Purchase (ficense)
- \$12,500
Number Installed to Dete: 6
Date First Installed: June 1981

GRAPHIC SOFTWARE
SYSTEMS
GSS-TERMINAL
Additional Product Classification:
Communications/TP Monitors
Specific Application: Terminal
Emulation (Graphics Terminal form
Micro)
System Requirements: IBM PC:
MS-DOS, Unix
Memory Required: 128.0K bytes
Source Language: C
Purchase Terms: Purchase (ticense)
Rumber Installed: August 1983
(See Vendor Profile Page V-13)

GUILD, INC.
THE GUILD CATALYST
Additional Product Classification:
Communications/TP Monitors
Specific Application: Totally
Portable Across Hardware, Enables
Networking Between Micros, Minis
and Mainfarnes
Additional Requirements: Motorola
68000: Catalyst; Euge 9000:
Catalyst; DeC: Catalyst; Sperry
1100: Catalyst; DeC: Catalyst; Sperry
1100: Catalyst; Euge 9000:
Purchase Termiz: Purchase (icense)
- \$250,000
Number Installed: March 1982
(See Vendor-Profile Page V-13)

QUANN ENTERPRISES, INC. CUSTOM CDOS I/O DRIVERS Additional Product Classification: Communications/TP Monitors Specific Application: Terminal Interface System Requirements: Cromernoc: C-DOS

Memory Required: 64.0K bytes Source Language: Assemble Purchase Terms: Purchase (license) - \$195 Number installed to Date: 300 Date Eret Installed: 1977

Number installed to Date: 300 Date First Installed: 1977 (See Vendor Profile Page V-13)

QUINN ENTERPRISES, INC.
MODER COMMUNICATIONS FOR
CROMEMOC
Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows
Transfer of Programs to and from
Cronix

System Requirements: Cromemco: Crombo

emory Required: 128.0K bytes Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license)

Number installed to Date: 40 Date First installed: 1982

H & A COMPUTER SYSTEMS **RSS-REMOTE SERIES 1 SERVICES** Additional Product Classification: Communications/TP Monitors Specific Application: Remote Operation and Service tem Requirements: IBM Series/

1, EDX Memory Required: 8.0K bytes Source Language: EDL Source Code Available: No Purchase Terms: Purchase (license) \$3,500 Number Installed to Date: 10 Date First Installed: 1982 (See Vendor Profile Page V-13)

HARRIS CORP. RJE HOST Communications/TP Monitors Specific Application: Remote Job Entry m Requirements: Harris 600, 700, 800: VOS Purchase Terms: Purchase (license) - \$2,600

(See Vendor Profile Page V-14)

HARRIS CORP. RJE TERMINAL EMULATION Additional Product Classification
Communications/TP Monitors Specific Application: Terminal Emulation ntem Requirements: Harris 600. 700. 800: VOS

HENSON SYSTEMS, INC. CRTX

Additional Product Classification: Communications/TP Monitors Specific Application: Communications System Requirements: IBM PC: MS-DOS; Columbia: MPC Memory Required: 42.0K bytes Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) \$100

Number Installed to Date: 400 Date First Installed: 1981 (See Vendor Profile Page V-14)

HENSON SYSTEMS, INC. CRTXE **Additional Product Classification:** Communications/TP Monitors Specific Application: Communications With Terminal Emulation System Requirements: IB MS-DOS; Columbia: MPC ente: IBM PC: Memory Required: 42.0K bytes Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) Number installed to Date: 200 Date First installed: 1981

HENSON SYSTEMS, INC. REMOTE

Additional Product Classification Communications/TP Monitors Specific Application: Allows the User to Remotely Execute A CP/M System System Requirements: CP/M Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license)

Number Installed to Date: 50 Date First Installed: 1981

HORNS COMPUTER SERVICES **RPSS-REMOTE PRINTER** SPOOLING

Additional Product Classification: Communications/TP Monitors Specific Application: Remote Printer Spooling System System Requirements: IBM 4300: DOS: IBM 370: CICS Source Language: Assemble Source Code Available: No Purchase Terms: Lease Number Installed to Date: 12 Date First Installed: 1981 (See Vandor Profile Page V-14)

HOUSTON COMPUTER SERVICES, INC. OCTACOMN/940 Additional Product Classification: Communications/TP Monitors Specific Application: Intelligent I/O Processor Interfaces with RS-232 Terminals Asyncronously System Requirements: TI 990: DX-10, D-NOS; TI Professional: MS-DOS Source Lenguage: Assembler,

Purchase Terms: Purchase (license) - \$2 750 Number installed to Date: 180 Date First Installed: October 1982 (See Vendor Profile Page V-14)

HOUSTON ENGINEERING RESEARCH CORP. TDC 2000 DRIVER Additional Product Classification: Communications/TP Monitors Specific Application: Communication Driver Between PDP-11 and Huneywell 2000 System Requirements: DEC PDP-11: RSX

Memory Required: 128.0K bytes Source Language: Fortran ee Terms: Purchase (license) - \$4.500

Number installed to Date: 3 Date First installed: 1978 (See Vendor Profile Page V-14) HOWARD W. SAMS & CO., INC.

HELLO CENTRALI Additional Product Classification: Communications/TP Monitors Specific Application: A Terminal Control Program That Allows the User Computer to Talk to Other Computers Over Telephone Lines System Requirements: Apple IIE:

Apple II+; Apple II: DOS Memory Required: 48.0K bytes Source Language: Assembly Purchase Terms: Purchase (license)

(See Vendor Profile Page V-14)

HOWE SOFTWARE SMART TERMINAL Additional Product Classifica Communications/TP Monitors Specific Application: Data Communications VIA RS-231C System Requirements: TRS-80: TRS-DOS, CP/M

Source Language: Assembler, Delivered Machine Purchase Terms: Purchase (license)

Number Installed to Date: 400 Date First Installed: January 1980 (See Vendor Profile Page V-14)

**HUNTER & READY, INC.** C INTERFACE LIBRARY (HEWLETT PACKARD) **Additional Product Clas** Communications/TP Monitors

Specific Application: Interfaces Programs Written in HPC to VRTX/68000 68000

Source Language: Assembly Purchase Terms: Purchase (license) \$450

Number Installed to Date: 100 Date First Installed: 1982 (See Vendor Profile Page V-14)

HUNTER & READY, INC. C INTERFACE LIBRARY (HEWLETT PACKARD)

**Additional Product Classificati** Communications/TP Monitors Specific Application: Interfaces Programs Written in HPC to VRTX/86

System Requirements: Intel 8086 Source Language: Assembly Purchase Terms: Purchase (license) - \$450

Number Installed to Date: 100 Date First installed: 1982

HUNTER & READY, INC. C INTERFACE LIBRARY (HEWLETT PACKARD)

Additional Product Classificati Communications/TP Monitors Specific Application: Interfaces Programs Written IN HPC to VRTX/8002 System Requirements: Zilog Z8002 Source Language: Assembly Purchase Terms: Purchase (license)

- \$450 Number Installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. C INTERFACE LIBRARY (MIT) **Additional Product Class** Communications/TP Monitors Specific Application: Interfaces Programs Written IN MITC to VRTX/68000

System Requirements: Motorola

Source Language: Assembly Purchase Terms: Purchase (license) - \$450 Number installed to Date: 100 Date First installed: 1982

HUNTER & READY, INC. C INTERFACE LIBRARY (MIT) **Additional Product Class** Communications/TP Monitors Specific Application: Interfaces Programs Written in MITC to VRTX/86

System Requirements: Intel 8086 Source Language: Assembly Purchase Terms: Purchase (license) - \$450

Number Installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. C INTERFACE LIBRARY (WHITE

SMITHS) Additional Product Classification Communications/TP Monitors Specific Application: Interfaces Programs Written IN White Smiths C to VRTX/68000 System Requirements: Motorola 68000

Source Language: Assembly Purchase Terms: Purchase (license) - \$450 Number installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. C INTERFACE LIBRARY (WHITE

SMITHS)
Additional Product Classification: Communications/TP Monitors Specific Application: Interfaces
Programs Written In White Smiths C to VRTX/8002 System Requirements: Zliog Z8002 Source Language: Assembly Purchase Terms: Purchase (license)

- \$450

Number installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. PASCAL INTERFACE LIBRARY (HEWLETT PACKARD) Additional Product Classifications/TP Monitors Specific Application: interfaces Programs Written in HP Pascal to VETY/68000

System Requirements: Motorola 68000 Source Language: Assembly Purchase Terms: Purchase (license) - \$450

Number Installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. PASCAL INTERFACE LIBRARY (HEWLETT PACKARD) Additional Product Class Communications/TP Monitors

Specific Application: Interfaces Programs Written IN HP Pascal to VRTX/86 System Requirements: Intel 8086 Source Language: Assembly Purchase Terms: Purchase (license) Number installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. PASCAL INTERFACE LIBRARY (HEWLETT PACKARD) Additional Product Classification: Communications/TP Monitors Specific Application: Interfaces Programs Written in HP Pascal to VRTX/8002 System Requirements: Zliog Z8002 Source Language: Assembly Purchase Terms: Purchase (license) Number Installed to Date: 100 Date First Installed: 1982

HUNTER & READY, INC. PL/M INTERFACE LIBRARY **Additional Product Classifica** Communications/TP Monitors Specific Application: Interfaces rograms Written in PL/M to VOTY/96 System Requirements: Intel 8086 Source Language: Assembly Purchase Terms: Purchase (license) \$450

CENTERN **Additional Product Classification:** Communications/TP Monitors

Number Installed to Date: 100 Date First Installed: 1982

Specific Application: Comprehensive Asynchronous Communications Package System Requirements: Apple II: Apple-DOS, CP/M; IBM PC, MS-Memory Required: 64.0K bytes

Source Language: CP/M Fortran, MS-DOS Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$79

Number installed to Date: 1,000 Date First installed: June 1983 (See Vendor Profile Page V-14)

IDE ASSOCIATES, INC. **IDEACOMM 1200** Additional Product Classifications Communications/TP Monitors Specific Application: Asynchronous Communications Package System Requirements: IBM PC, PC-00820

Memory Required: 128.0K bytes Source Language: Assembly, C Humber Installed to Date: 250 Date First Installed: October 1983 (See Vendor Profile Page V-15)

IDE ASSOCIATES, INC.

**IDEACOMM 3278** Additional Product Cleanification: Communications/TP Monitors Specific Application: Allows An IBM PC to Emulate A 3278 System Requirements: IBM PC, PC-DOS 2.0 Memory Required: 128.0K bytes

Source Language: Assembly, C Purchase Terms: Purchase (license) \$1,195 ber installed to Date: 2

Date First Installed: 1983

IDF ASSOCIATES, INC.

IDEANET Additional Product Classification: Communications/TP Monitors ecific Application: Allows An IBM PC to Communicate Over Coaxial Cable System Requirements: IBM PC, PC-DOS 20

Memory Required: 128.0K bytes Source Language: Assembly, C Purchase Terms: Purchase (license)

Date First Installed: January 1984 IDE ASSOCIATES, INC.

Additional Product Classification: Communications/TP Monitors cific Application: Allows An IBM PC to Communicate Via An Asynchronous RS-232 Cable System Requirements: IBM PC, PC-DOS 2.0 Memory Required: 128.0K bytes Source Language: Assembly, C Purchase Terms: Purchase (license) - \$595

Number installed to Date: 1 Date First installed: December 1983 IE EVETEME INC

**ACCULINE** Additional Product Classification: Communications/TP Monitors Specific Application: Protocol Emuluation System Requirem anta: IBM: CP/M: Zerox 820: MS-DOS; NEC: PC-DOS; Tandy Memory Required: 128.0K bytes

Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) . 8245

Number Installed to Date: 1,000 Date First Installed: August 1979 (See Vendor Profile Page V-15)

IF SYSTEMS, INC. BIS - 3270 **Additional Product Classification:** Communications/TP Monitors Specific Application: Protocol Emulation System Requirements: IBM: CP/M; Zerox 820: MS-DOS; NEC: PC-DOS;

Tandy Memory Required: 128.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) \$695

Number Installed to Date: 1.000 Date First Installed: November 1980

IE SYSTEMS, INC. BIS - 3780

Additional Product Classification: Communications/TP Monitors Specific Application: Protocol Emulation quirements: IBM: CP/M: System Re Zerox: MS-DOS; NEC: PC-DOS; Tandy Memory Required: 128.0K bytes Source Language: Assembler

Source Code Available: No Purchase Terms: Purchase (license) \$695

Number Installed to Date: 1,000 Date First Installed: January 1979

IE SYSTEMS, INC. BIS-HASP

Additional Product Classification: Communications/TP Monitors Specific Application: Protocol Emulation Zerox 820: MS-DOS; NEC: PC-DOS;

Tandy Memory Required: 128.0K bytes Source Language: Assembler Source Code Available: No

- \$995 Number installed to Date: 1,000 Date First installed: May 1982

IE SYSTEMS, INC. **BIS-3270 VERSION 4.0** Additional Product Classification: Communications/TP Monitors Specific Application: 3270 Emulation Software for Microcomputers System Requirements: CP/M. CP/M 86, MS-DOS Memory Required: 64.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license)

Number Installed to Date: 600 Date First installed: November 1980 INDUSTRIAL COMPUTER

CORP. DDCMP 1000 **Additional Product Classification:** Communications/TP Monitors cific Application: Provides DEC to HP 1000 Communication System Requirements: HP 1000 Memory Required: 64.0K bytes Source Language: Fortran, Source Code Available: No Purchase Terms: Purchase (license)

Number Installed to Date: 5 Date First Installed: January 1983 (See Vendor Profile Page V-15)

INFOMEDIA CORP. JENNY

Additional Product Classification: Communications/TP Monitors Specific Application: Electronic Mail Package System Requirements: HP 3000:

MPE Source Language: SPL Source Code Available: No Purchase Terms: Lease Number Installed to Date: 10 Date First Installed: 1981 (See Vendor Profile Page V-15)

INFORMATION CONCEPTS,

CICS APPLICATION FILE CONTROL.
Additional Product Classification: Communications/TP Monitors

Specific Application: Batch-TO-CICS Communications, Streamlines Restart Activity System Require MVS; IBM 30XX; IBM 360; IBM 370 Source Language: Assembler Purchase Terms: Purchase (license) - \$2,500 Number installed to Date: 76 Date First Installed: 1980 (See Vendor Profile Page V-15)

TECHNOLOGIES

DEDICOM Additional Product Classification: Communications/TP Monitors Specific Application: Communications Switching Program System Requirements: DG: Unix; TI; Perkin Elmar Memory Required: 256.0K bytes Source Language: C
Purchase Terms: Purchase (license)
- \$20,000 to \$40,000 Number installed to Date: 20 Date First Installed: September 1982 (See Vendor Profile Page V-15)

RGANIZATION CORP OCR (OPTICAL CHARACTER BEADER) INTERFACE Additional Product Cla WP/Text Editing, Communications/TP Monitors Specific Application: OCR Interface Specific industry: Legal System Requirements: Wang VS Memory Required: 256.0K bytes Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) \$1,000

Number Installed to Date: 20 Date First Installed: May 1980 (See Vendor Profile Page V-15)

THE INFORMATION ORGANIZATION CORP. WANG VS TO HIGH SPEED PRINTER

Additional Product Classification Communications/TP Monitors, Speed Printer cific Application: Sends Wang WP to High-Speed Printer System Requirements: Wang VS emory Required: 256.0K bytes Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) - \$4,000 Number installed to Date: 2 Date First installed: August 1982

THE INFORMATION ORGANIZATION CORP. WANG VS TO IBM DISPLAY

Additional Product Classification: Communications/TP Monitors. Display Writer Specific Application: Telecommuncations Interface Package Translates Wang WP to IBM Display Writer and IBM to Wang System Requirements: Wang VS Memory Required: 256.0K bytes Source Language: Cobol Source Code Available: No Purchase Terme: Purchase (license) - \$4,000 Number Installed to Date: 2 Date First Installed: May 1982

THE INFORMATION ORGANIZATION CORP. WANG VS TO OCR INTERFACE Additional Product Classification: Communications/TP Monitors Specific Application: Wang VS to System Requirem System Requirements: Yeary vo Memory Required: 256.0K bytes Source Language: Cobol Source Code Available: No Purchase Terms: Purchase (license) - \$1,000 Number Installed to Date: 23 Date First Installed: May 1980

INFOSERVICES, INC. INFOCOMM/INFOHOST ANSWER-DB **Additional Product Classification:** Communications/TP Monitors, Library Management, Report Specific Application: Communications from Micros to Prime and Micro to Micro System Requirements: CP/M, MS/D Memory Required: 32.0K bytes Source Code Available: No see Terms: Purchase (license) \$3.500 Date First Installed: 1981 (See Vandor Profile Page V-15)

MULTI/NET **Additional Product Classification:** Communications/TP Monitors, Networking Specific Application: Networking Memory Required: 32.0K bytes Source Language: 8080 Assembler, Infosoft C

INFOSOFT SYSTEMS, INC.

INFOSOFT NETWORK SYSTEM -

Purchase Terms: Purchase (license) Date First installed: September 1982 (See Vendor Profile Page V-15)

INFOSOFT SYSTEMS, INC. (COMMUNICATION SYSTEM) Additional Product Classification Communications/TP Monitors Specific Application: Communications Memory Required: 3.2M bytes Source Language: 8080 Assembler Purchase Terms: Purchase (license) Date First Installed: August 1976

INNOVATEK MICROSYSTEMS, INC. COMMUNICATION LINK

**Additional Product Classification:** Communications/TP Monitors Specific Application: High-Speed Communications to Remote Systems System Requirements: DEC PDPnents: DEC PDP-11: RT-11: DEC LSI-11: RT-11 Memory Required: 12.0K bytes

Source Language: Macro Purchase Terms: Purchase (license) \$775 Date First Installed: 1978 (See Vendor Profile Page V-16)

INTEGRATED DESIGN ENGINEERING, INC. Additional Product Classification: Communications/TP Monitors Specific Application: Data

Communications System Requirements: NCR Decision Mate V: CP/M, MS-DOS Memory Required: 64.0K bytes Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) \$400 Date First installed: August 1983 (See Vendor Profile Page V-16)

INTELLIGENT TECHNOLOGIES INTERNATIONAL CORP. CLUSTER NET 3270 Additional Product Classification: Communications/TP Monitors Specific Application: Multiple 3278 Cluster Emulation - PC to PC System Requirements: IBM PC. Memory Required: 256.0K bytes

erce Language: Compiled Basic, C, Assembler Purchase Terms: Purchase (license) - \$8,303 (See Vendor Profile Page V-16)

INTELLIGENT TECHNOLOGIES INTERNATIONAL CORP. PC EXPRESS 1

Additional Product Classification: Communications/TP Monitors Specific Application: Electronic il, PC to PC Link, DEC VT100/VT52 Emulator System Requirements: IBM PC, MS-DOS Memory Required: 256.0K bytes Source Language: Compiled Basic,

Source Code Available: No Purchase Terms: Purchase (license) Date First Installed: March 1983

INTELLIGENT TECHNOLOGIES INTERNATIONAL CORP. PC EXPRESS 2

**Additional Product Classification:** Communications/TP Monitors Specific Application: Electronic Mail, PC to PC Link, DEC VT100/VT52 Emulator System Requirements: IBM PC, MS-DOS mory Required: 256.0K bytes Source Language: Compiled Basic, C, Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$1,295 Date First Installed: March 1983

INTERCON RESEARCH CORP. INTERCON 100A Additional Product Classification: Communications/TP Monitors

Specific Application: Communications Software for Front Fnd Processing System Requirements: DEC VA VMS: DEC PDP-11: CP/M, Unix mte: DEC VAX: Memory Required: 15.0K bytes Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license); Lease - \$1,250 to \$4,995 Date First Installed: January 1983 (See Vendor Profile Page V-16)

INTERMETRICS

Additional Product Classification Communications/TP Monitors ecific Application: Communications Link Between Minis and Mainframes System Requirements: Intel Source Language: C Purchase Terms: Purchase (license) (See Vendor Profile Page V-16)

INTERNATIONAL DIGITAL ELECTRONICS ASSOCIATES COMMUNICATION

Additional Product Classification: Communications/TP Monitors Specific Application: Telex, TWX. Special Protocols ecific Industry: Communications System Requirements: Intel: BTX; Source Language: Assembler Purchase Terms: Purchase (license)

\$1.500 Number Installed to Date: 100 Date First installed: 1982 (See Vendor Profile Page V-17)

KEYBROOK BUSINESS SYSTEMS, INC. KEYBROOK FILESERVER Additional Product Classification Communications/TP Monitors Specific Application: Networking System for CP/M Micro Computers System Requirements: Xerox 820; Sanyo: CP/M; Altos Source Language: Z-80 Assembly Purchase Terms: Purchase (license) - \$2,700 Number installed to Date: 50 Date First installed: 1982 (See Vendor Profile Page V-17)

KEYSTONE DATA CONSULTANTS, INC. FILE TRANSMISSION PACKAGE Additional Product Classification: Communications/TP Monitors Specific Application: Tranmits Information from One Machine to Another System Requirements: DEC PDF 11: RSX mory Required: 128.0K bytes Source Language: Macro II Purchase Terms: Purchase (license)

- \$1,200 Number installed to Date: 6 Date First installed: 1982

LEARNED-MANN ASTALK Additional Product Classification: Data/File Management, Communications/TP Monitors Specific Application:
Communications and File Building
System Requirements: IBM PC; GE
Time-sharing System Memory Required: 64.0K bytes Source Language: Basic Purchase Terms: Purchase (license) - \$295 Number Installed to Date: 100
Date First Installed: August 1982
(See Vendor Profile Page V-17)

LEGIST AUTOMATION, INC. UT 200 Additional Product Classificati Communications/TP Monitors Specific Application: Terminal Emulator System Requirements: Four Phase 4. MEE Source Language: Cobol Source Code Available: No

Purchase Terms: Purchase (license) \$10,000 Number Installed to Date: 3 Date First Installed: 1982 (See Vendor Profile Page V-18)

LINDBERGH SYSTEMS OMNITERM Additional Product Classification: Communications/TP Monitors Specific Application: Smart Terminal Software With File Transfer System Requirements: TRS-80 Models I, II, III, 12 Source Code Available: Yes Purchase Terms: Purchase (license) \$95 to \$175 - \$95 to \$175 Number Installed to Date: 1,000 Date First Installed: January 1980 (See Vendor Profile Page V-18)

LINK SYSTEMS Additional Product Classification: Communications/TP Monitors Specific Application Communicates to Other Data Base

System Requirements: Apple II, IIE, III: UCSD-P System; IBM PC-XT, **UCSD-P System** Memory Required: 64.0K bytes Source Language: Pascal Source Code Available: No Purchase Terms: Purchase (license) Date First installed: August 1983 (See Vendor Profile Page V-18)

LOGICA, INC.

FASTRAN Additional Product Classification: Communications/TP Monitors Specific Application: Bank Cable Room and Funds Transfer Automation Software Specific Industry: Banking/Financial, System Requirements: DEC PDP-11: BSX: Tandem Memory Required: 1.0M bytes Source Language: Macro, C Purchase Terms: Purchase (license); Rental; Lease - \$100,000 Number installed to Date: 20 Date First installed: 1979 (See Vendor Profile Page V-18)

LOGICA, INC.

FASTRX **Additional Product Classificati** Communications/TP Monitors Specific Application: Transaction Processing and Message Switching Applications Specific industry: Banking/Financial, International System Requirements: DEC PDP-11: RSX: Tandem Memory Required: 1.0M bytes Source Language: Macro, C Purchase Terms: Purchase (license); Rental; Lease - \$75,000 Number Installed to Date: 25 Date First Installed: 1979

LOGICA, INC.

FASTWIRE Additional Product Classification Communications/TP Monitors Specific Application: Bank Cable Room and Funds Transfer Automation Software Specific Industry: Banking/Financial, International System Requirements: DEC PDP-11: RSX Memory Required: 1.0M bytes Source Language: Macro, C Purchase Terms: Purchase (license);

Rental; Lease - \$100,000 Number Installed to Date: 3 Date First Installed: 1982 **MACKINNEY SYSTEMS** 

CICS/SPOOLER Additional Product Classification: Communications/TP Monitors Specific Application: Print Spooler System System Requirements: IBM 370. 4300, 30XX Memory Required: 32.0K bytes Source Language: Cobol, Purchase Terms: Purchase (license); 6886 - \$995 Date First Installed: October 1983 (See Vendor Profile Page V-18)

MAGNUM COMMUNICATIONS. LTD.

CREDICHECK Additional Product Classification: Communications/TP Monitors Specific Application: System to System Credit Bureau Access System Specific Industry: Retail, Banking/Financial System Requirem note: IRM Mainframe: CICS Memory Required: 30.0K bytes Source Language: Cobol, Assembler, EDL Purchase Terms: Purchase (license) - \$9,500 to \$35,500 Number Installed to Date: 7 Date First Installed: 1977 (See Vendor Profile Page V-18)

**MATHEMATICA PRODUCTS** OBOUR ATLAS

Additional Product Classification: Communications/TP Monitors Specific Application: Data

Communications Monitor System Requirements: IBM: DOS/VSE Source Language: Assembler Source Code Available: No Purchase Terms: Pt hase (license); Rental; Lease - \$28,000 Number Installed to Date: 40 Date First Installed: 1982 (See Vendor Profile Page V-18)

MCCORMACK & DODGE CORP.

PC·M Additional Product Classification: Communications/TP Monitors Specific Application: Personal Computer Link from Micro to Mainframe System Requirements: IBM: OS, Memory Required: 100.0K bytes

Source Language: Cobol Purchase Terms: Purchase (license) \$10,000 Date First Installed: 1983 (See Vendor Profile Page V-18)

MCDONNELL DOUGLAS AUTOMATION CO. MCAUTO SYSTEM 1 **Additional Product Classification** Communications/TP Monitors Specific Application: Manage A Distributed Environment Between A Local Minicomputer Dedicated to An Engineering Project and A Backup Mainframe Specific Industry: Manufacturing, Engineering, Construction, Government, Transportation System Requirements: DEC: VMS Memory Required: 1.0K bytes Source Code Available: No Purchase Terms: Purchase (license): Date First Installed: February 1983 (See Vendor Profile Page V-18)

MCM ENTERPRISES

PROCALL Additional Product Classification Communications/TP Monitors Specific Application: Communicates With Bulletin Boards Large Computers Between Cromemoo Systems Multi- and Single-User Environments, Christianson Protocol Or Program Transfers System Requirements: Cromer C10: C-DOS: Cromeraco S100:

Memory Required: 64.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) \$350 Number Installed to Date: 150 Date First Installed: December 1982 (See Vendor Profile Page V-19)

MEGAWEST SYSTEMS, INC. Additional Product Classification

Communications/TP Monitors Specific Application: Communications Package System Requirements: IBM PC; Mentor: Pick; Micro Data Memory Required: 64.0K bytes Source Language: Data Basic Purchase Terms: Purchase (license) \$2,000 Number Installed to Date: 45 Date First Installed: 1980 (See Vendor Profile Page V-19)

MERIDIAN TECHNICAL ASSOCIATES, INC.

**Additional Product Classifica** Communications/TP Monitors Specific Application: Terminal System Requirements: Zenith/Heath H8: H-DOS; Zenith/Heath H/Z89: CP/M; Zenith/Heath H/Z90: CP/M-85; Zenith/Heath H/Z100: Z-DOS Memory Required: 32.0K laytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$30 Number Installed to Date: 12 Date First Installed: November 1983 (See Vendor Profile Page V-19)

MICRO-INTEGRATION, INC. **BIS 3270 VERSION 4.0** Additional Product Classificati Communications/TP Monitors Terminal Emulator nts: CP/M. CP/M System Requires 86, MS-DOS, PC-DOS Memory Required: 64.0K bytes Source Language: Assemble Source Code Available: No nase Terms: Purchase (license) Number installed to Date: 2,000 Date First installed: November 1980 (See Vendor Profile Page V-19)

MICRO-INTEGRATION, INC. BIS 3780 VERSION 5.0 Additional Product Classificat Communications/TP Monitors Specific Application: IBM 2780, 3780 Emulator Communications Remote Job Entry System Require te: CP/M CP/M 86. MS-DOS. PC-DOS Memory Required: 64.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$695 Number installed to Date: 2,000 Date First Installed: September

MICRO-INTEGRATION, INC. **BIS HASP VERSION 1.1** Additional Product Classificati Communications/TP Monitors Specific Application: Hasp Multi-Leaving Workstation Communications; Remote Job Entry System Requirements: CP/M, CP/M 86, MS-DOS, PC-DOS Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license)

Number Installed to Date: 50 Date First Installed: September

ICRO-INTEGRATION, INC.

COAXSYS TM **Additional Product Classification:** Communications/TP Monitors Specific Application: IBM 3270 Coaxial Interface Hardware and Software ents: CP/M, CP/M 86, MS-DOS, PC-DOS Memory Required: 64.0K bytes Source Language: Pascal, Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$1 195

MICRO-INTEGRATION, INC. MICRO-SNA/3270 VERSION 1.0 Additional Product Classification Communications/TP Monitors Specific Application: IBM 3270 Terminal Emulator, Communication System Requirements: CP/M, CP/M 86, MS-DOS, PC-DOS Memory Required: 64.0K bytes Source Language: Assembler, Pascal Source Code Available: No

Purchase Terms: Purchase (license)

MICRO-INTEGRATION, INC. MICRO-SNA3770 Additional Product Classification: Communications/TP Monitors Specific Application: IBM 3770 Terminal Emulator, Communications, Remote Job Entry em Requ its: CP/M, CP/M 86, MS-DOS, PC-DOS Memory Required: 64.0K bytes Source Language: Assembler, Source Code Available: No Purchase Terms: Purchase (license)

MICRO/MACRO SYSTEMS.

BI-SYNC onal Product Classification: Communications/TP Monitors Specific Application: Remote Job Entry System Requirements: Victor 9000

Memory Required: 128.0K bytes Source Code Available: No Purchase Terms: Purchase (license) \$495 Date First Installed: September

(See Vendor Profile Page V-19)

MICRON, INC. COMM LINE

Additional Product Classification: Communications/TP Monitors Specific Application: Monitors Communication Between Computers System Requirements: TRS-80, TRS-DOS Memory Required: 64.0K bytes Source Language: Assembly
Purchase Terms: Purchase (license) Date First Installed: 1983 (See Vendor Profile Page V-19)

MICRON, INC. SMART TERM I

Additional Produ et Classification: Communications/TP Monitors Specific Application: Makes Mini Look Like Intelligent Terminal nts: TRS-80. m Requirem TRS-DOS

mory Required: 32.0K bytes Source Language: Assembly
Purchase Terms: Purchase (license)
Number Installed to Date: 200
Date First Installed: 1979

# THE MICROPERIPHERAL CORP. TSMART

Additional Product Classification: Communications/TP Monitors Specific Application: Allows Up/Down Loading, Allows Transferable On/Off Selectable Communications Parameters System Requirements: Atari lemory Required: 32.0K bytes Source Language: Basic, Assembly Purchase Terms: Purchase (license) - \$50 Date First Installed: January 1981 (See Vendor Profile Page V-19)

MICROSPARC, INC. TELETEXT **Additional Product Classification:** Communications/TP Monitors Specific Application: A General Purpose Data Communications Package m Requirements: Apple II+. Syst IE. DOS Memory Required: 48.0K bytes Source Language: Applesoft, 6502 Machine Language Purchase Terms: Purchase (license) \$80

Number Installed to Date: 100 Date First Installed: June 1982 (See Vendor Profile Page V-19)

MICROSTUF, INC. CROSSTALK XVI

Additional Product Classification Communications/TP Monitors Specific Application: Integrated Help System Emulates Several Terminals, Supports Most Autodial Moderns Capable Of Totally Automated File Transmission System Requirements: IBM PC: MS-DOS; Victor 9000; Eagle 1600; Corona mory Required: 96.0K bytes

Source Language: Assembly Purchase Terms: Purchase (license) - \$195

(See Vendor Profile Page V-19)

### MICROSTUF, INC. REMOTE

Additional Product Classification: Communications/TP Monitors Specific Application: Remote Console Program Allows You to Call Into Your Microcomputer System Requirements: IBM PC: MS-DOS; Televideo: CP/M; Eagle;

North Star Source Language: Assembly

MICROSTUF, INC.

TRANSPORTER **Additional Product Classification** Communications/TP Monitors Specific Application: Automated Data Communications Program Designed for Unattended Information Exchange System Requirements: IBM PC: MS-DOS

Memory Required: 96.0K bytes Source Language: Assembly Source Code Available: No ase Terms: Purchase (license) . \$206

MICRO-SYSTEMS SOFTWARE, INC. BBS-80

Additional Product Classification: Communications/TP Monitors Specific Application: Bulletin Board System That Hooks into Microcomputers via Telephone System Requirements: TRS-80/I; TBS-80/III

Source Language: Basic Source Code Available: No Purchase Terms: Purchase (license) \$80

Date First Installed: 1981 (See Vandor Profile Page V-19)

MICRO-SYSTEMS SOFTWARE, MICROTERM

Additional Product Classification: Communications/TP Monitors Specific Application: Turns Microcomputer into A Terminal to Hook Up Into Mainframes System Requirements: TRS-80; IBM PC; Apple II, IIE Source Language: Basic Source Code Available: No Purchase Terms: Purchase (license) - \$80 Date First installed: 1982

MICRO-SYSTEMS SOFTWARE,

QUADROMACK Additional Product Classification: Communications/TP Monitors

Specific Application: Communication System That Ties 4 TRS-80 Model I, III, IV to 1 Hard Disk System Requirements: TRS-80/I: TRS-80/III; TRS-80/IV Source Language: Basic Source Code Available: No Purchase Terms: Purchase (license) \$900 to \$1,000 **Date First Installed: August 1983** 

MODULAR INTEGRATION, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Protocol Converter Package, Synchronous to Asynchronous Converter Specific Industry: Weather Power System Requirements: IBM PC: CP/M 86, MS-DOS nory Required: 256.0K bytes

Purchase Terms: Purchase (license): Number installed to Date: 500 Date First installed: 1978 (See Vendor Profile Page V-20)

MODULAR INTEGRATION, INC. SDLC/HDLC

Additional Product Classification: Communications/TP Monitors Specific Application: SDLC/HDLC Communications Package Specific Industry: Weather Power tem Requirements: CP/M 86, MS-DOS

Memory Required: 256.0K bytes Purchase Terms: Purchase (license); Lease - \$1,000

Number Installed to Date: 500 Date First installed: 1978

MOHAWK DATA SCIENCES CORP. BSC 3741

Additional Product Classification: Communications/TP Monitors Specific Application: Communications om Requirements: MDS Series 21: OS/2 Source Language: Mobol/Z80 Source Code Available: No (See Vandor Profile Page V-20)

MOHAWK DATA SCIENCES

EM 3275 Additional Product Classification: Communications/TP Monitors ecific Application: Communications System Requirem te: MDS Series Source Language: Mobol/Z80 Source Code Available: No

MOHAWK DATA SCIENCES CORP.

MASP/WS Additional Product Classification: Communications/TP Monitors Specific Application: Communications System Requirements: MDS Series 21, OS/2 Memory Required: 9.6M bytes Source Language: Mobol/Z80 Source Code Available: No

Purchase Terms: Purchase (license) MOHAWK DATA SCIENCES CORP. REMOTE COPY

Additional Product Classification: Communications/TP Monitors Specific Application: Communicati ons System Requirements: MSD Series 21, OS/2 Source Language: Mobol/Z80 Source Code Available: No

MONROE SYSTEMS FOR BUSINESS

ASCOM + Additional Product Classification: Communications/TP Monitors Specific Application: Asynchronous Communications Utility System Require 8800: CP/M-80 ete: Monroe OC Memory Required: 128.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license); Lease - \$175 Date First Installed: 1981 (See Vendor Profile Page V-20)

MONROE SYSTEMS FOR BUSINESS

MONROE BIS - 3780 Additional Product Classification: Communications/TP Monitors Specific Application: Synchronous 2780/3780 Emulation nants: Monroe OC System Requir 8800: CP/M 80 Memory Required: 128.0K bytas Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (licanee); 8888 - \$750 Date First installed: 1981

MONROE SYSTEMS FOR

BUSINESS MONROE BIS- 3270 Additional Product Classification: Communications/TP Monitors Specific Application: Synchronous Communciations System Requirements: Monroe OC 8800: CP/M 80 Memory Required: 128.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license); Lesse - \$750 Date First Installed: 1981

MONROE SYSTEMS FOR

MONROE TTY EMULATOR Additional Product Classificat Communications/TP Monitors Specific Application: Asynchronous Communications Utility System Requirements: Monroe OC 8800: MS-10; Monore EC 8800: MS-10

Memory Required: 128.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license): Lease - \$95 Date First installed: 1981

MONROE SYSTEMS FOR BUSINESS

MONROE BIS -HASP Additional Product Classification: Communications/TP Monitors Specific Application: Multileaving Workstation Emulation System Requirements: Monroe OC 8800: CP/M 80 Memory Required: 128.0K bytes Source Language: Assembler Purchase Terms: Purchase (license); Lesse - \$795 Date First Installed: 1981

MONROE SYSTEMS FOR BUSINESS MONROE 3270 SNA/SDLC Additional Product Classifics Communications/TP Monitors Specific Application: SNA 3270 Display Emulation m Requirements: Monroe OC 8800- MS-10 Memory Required: 128.0K bytes Source Language: Assemble Source Code Available: No Purchase Terms: Purchase (license); Lease - \$995 Date First Installed: 1981

MOUNTAIN COMPUTER, INC. SUPER TALKER Additional Product Classificat Communications/TP Monitors Specific Application: Speech Digitizer System Requirements: Apple; IBM Purchase Terms: Purchase (license) (See Vendor Profile Page V-20)

*NUMFORD MICRO SYSTEMS* DEMON Additional Product Classification: Communications/TP Monitors Specific Application: Monitor and Debugger

System Requirements: TRS-80:

Memory Required: 32.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$29

Date First Installed: 1983 (See Vendor Profile Page V-21)

MUMFORD MICRO SYSTEMS TELCOM II

Additional Product Classification: Communications/TP Monitors Specific Application: Advanced Telecommunications System Requirements: TRS-80: DOS Memory Required: 32.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$69 Date First Installed: 1982

**MUMFORD MICRO SYSTEMS** TELECOM I Additional Product Classification: Communications/TP Monitors Specific Application: Telecommunications System Requirements: TRS-80: DOS Memory Required: 32.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license)

Date First Installed: 1980

**NATIONAL E-F-Y, INC.** LINK/1 Additional Product Classification: Communications/TP Monitors Specific Application: Communications Support Package Specific Industry: Manufacturing, Banking/Financial System Requirements: IBM Series/

Memory Required: 64.0K bytes Source Language: Cobol

Purchase Terms: Purchase (license) \$20,000 Number Installed to Date: 2 Date First Installed: 1982 (See Vendor Profile Page V-21)

NATIONAL MICRO PRODUCTS, INC. MODEM

**Additional Product Classification** Communications/TP Monitors Specific Application: Order Entry System Requirements: Intertec Compustar: CP/M Memory Required: 64.0K bytes Source Language: Basic, Pascal, Assembler Purchase Terms: Purchase (license) - \$40 000 Date First Installed: December 1983

(See Vendor Profile Page V-21) NATIONAL MICRO PRODUCTS,

INC.

SMODEM Additional Product Classification Communications/TP Monitors Specific Application: Order Entry System Requirements: Intertec Compustar, CP/M Memory Required: 64.0K bytes Source Language: Basic, Pascal, Assemble

Purchase Terms: Purchase (license) - \$40,000 Date First Installed: December 1983

NATIONAL MICRO PRODUCTS.

**Additional Product Classification:** Communications/TP Monitors Specific Application: Order Entry System Requirements: Intertec Compustar, CP/M Memory Required: 64.0K bytes Source Language: Basic, Pascal, Purchase Terms: Purchase (license) \$40,000

Date First installed: December 1983

NATIONAL SEMICONDUCTOR CORP. ANS-TRAN

Additional Product Classification: Communications/TP Monitors Specific Application: Enables POS Systems to Communicate With Host Computers Specific Industry: Food System Requirements: DEC PDP-

mory Required: 256.0K byte Source Language: IMP, Macro-11 (See Vendor Profile Page V-21)

NATIONAL SEMICONDUCTOR CORP. BHCS

Additional Product Classification: Communications/TP Monitors Specific Application: Enables POS Systems to Communicate With Host Computers Specific Industry: Food

System Requirements: DEC PDP-11: RSX-11 lemory Required: 256.0K bytes

Source Language: IMP, Macro-11 Source Code Available: No

NCR COMTEN. INC. ACF/NCP 3 Additional Product Classification Communications/TP Monitors Specific Application: Compatible With IBM ACF/NCR. Enables Increase of Data Access Within The Network By Supporting Various Systems System Requirements: NCR: SCS

63/Cross 2 Source Language: Codel
Purchase Terms: Purchase (license)
Date First Installed: 1982
(See Vendor Profile Page V-21)

NCR COMTEN. INC. CNS 2-COMMUNICATIONS NETWORKING SYSTEM Additional Product Class Communications/TP Monitors Specific Application: Network Trunking Facility to Interconnect NCR Comten 3600 Systems System Requirements: NCR Source Language: Codel
Purchase Terms: Purchase (licanse)
Date First Installed: 1981

HCR COMTEN, INC. **EP 4-EMULATION PROCESSING** Additional Product Classification Communications/TP Monitors Compatible Comten 3600 Communication Processors to Function As Or Emulate IBM 270X/IBM 370X Program Controllers System Requirements: NCR Comten 3600: SCS 63/Cross 2 Source Language: Codel Purchase Terms: Purchase (license) Date First Installed: 1981

MAF 3-3270 MULTIPLE ACCESS EACH ITY Additional Product Classificati Communications/TP Monitors Specific Application: Allows 3270 Devices to Select Any Emulation Host Application Defined in The

System Requirements: NCR Source Language: Codel Purchase Terms: Purchase (license) Date First Installed: 1981

NCR COMTEN, INC. NTO-NETWORK TERMINAL

Additional Product Classification Communications/TP Monitors Specific Application: Allows ACF/NCP 3 Product to Select SNA Start/Stop Devices Which Communicate System Requirements: NCR Source Language: Codel
Purchase Terms: Purchase (license)
Date First Installed: 1981

NCR COMTEN. INC. SRM 1-SUB AREA ROUTING Additional Product Classification: Communications/TP Monitors Bysynchronous and SNA 3270 Devices to be Dynamically Routed to Emulator or SNA Host Access Methods System Requirements: NCR

Source Language: Codel Purchase Terms: Purchase (license)

NCB CONTEN. INC. X.25 PUBLIC DATA NETWORK Additional Product Classification: Communications/TP Monitors Specific Application: Supports The Public Data Network System Requirements: NCR Source Language: Codel Purchase Terms: Purchase (license)

NCR CORP. NCR-DMS/TRAN-PRO EL Additional Product Classifica Communications/TP Monitors Specific Application: Entry Level Transaction Processing Monitor Specific Industry: Manufacturing, Engineering, Wholesale/Distribution, Retail, Banking/Financial, Medical, Legal, insurance, Real Estate. Education, Construction, Government, Transportation, Non-Profit Organizations, Scientific System Requirements: NCR V-8500, VRX; NCR V-8000 Series, VRX

Memory Required: 1.0K bytes Source Language: Cobol, NEAT/VS Source Code Available: No Purchase Terms: Purchase (license): Rental

Number installed to Date: 6 Date First installed: October 1982 (See Vendor Profile Page V-21)

HESTAR SYSTEMS, INC. 'MESSENGER' ELECTRONIC MAIL. Additional Product Classification: Communications/TP Monitors, Insurance, Mail System Specific Application: Memos/Letters Sent Between Users Connected by Same Local Network ratem Requirements: Apple II: scal; Apple III: SOS; IBM PC: DOS, CP/M Memory Required: 64.0K bytes Source Language: Pascal Purchase Terms: Purchase (license) Number installed to Date: 500 Date First Installed: 1981 (See Vendor Profile Page V-21)

MESTAR SYSTEMS, INC. 3270 CLUSTER EMULATOR SERVER

Additional Product Classification: Communications/TP Monitors Specific Application: 3270 System Requirem Pascal; IBM PC: PC-DOS Memory Required: 64.0K bytes Source Language: Pascal Source Code Available: No Purchase Terms: Purchase (license) \$2,000

- \$39

Purchase Terms: Purchase (license) - \$2,000 Number Installed to Date: 1,000 Date First Installed: 1982

HESTAR SYSTEMS, INC. 3278 EMULATOR

Additional Product Classification: Communications/TP Monitors Specific Application: Emulates IBM 3278 Model II for PC On the Same Local Network AS IBM 3274 Emulator

System Requirements: Apple II: Pascai; Apple III: SOS; IBM PC: DOS, CP/M Memory Required: 64.0K bytes Source Language: Pascal Source Code Available: No Purchase Terms: Purchase (license)

- \$200 Date First Installed: July 1983

NESTAR SYSTEMS, INC.
3770 EMULATOR SERVER
Additional Product Classification:
Communications/TP Monitors
Specific Application: 3770
Emulation
System Requirements: IBM PC; PCDOS; Apple II: Pascal; Apple III: SOS
Memory Requiremed: 64.0K bytos
Source Code Available: No
Purchase Terms: Purchase (Icense)
-51,000
Number Installed: 1982.

NESTAR SYSTEMS, INC.
FILE TRANSPER SERVER
Additional Product Classification:
Communications/TP Monitors
Specific Application: Provides
Batch Transfer of Files
System Requirements: Apple II,
Pascal; Apple III, SOS; IBM PC, PCDOS, CPIM
Memory Required: 64.0K bytes
Source Code Availables: No
Purchase Terms: Purchase (license)
-52,000
Number Installed: 1981

NEW GENERATION SYSTEMS, INC. AMCALL

Additional Product Classification: Communications/TP Monitors Specific Application: Communications Package System Requirements: Compupro, CP/M Memory Required: 64.0K bytes

Source Language: C, Assembly Source Code Available: No Purchase Terms: Purchase (license) - \$150 Date First Installed: January 1982 (See Vendor Profile Page V-22)

N. F. SYSTEMS, LTD. HOST COMM

Additional Product Classification: Communications/TP Monitors Specific Application: Host Communications Package System Requirements: IBM PC: MS-DOS: Compaq Memory Required: 128.0K bytes Source Code Available: No Purchase Terms: Purchase (Icense) -5120 Numper Installed to Date: 200 Date First Installed: September

1982

NIXDORF COMPUTER CORP.
3270 BISYNC EMULATOR
Additional Product Cleasification:
Communications/TP Monitors
Specific Application: interactive
Communication Between 8860 and
Host
System Requirements: Nixdorf

(See Vendor Profile Page V-21)

8860: Dipos Memory Required: 512.0K bytes Source Language: Assembler Purchase Terms: Rental Number Installed to Dete: 5,000 (See Vendor Profile Page V-22)

NIXDORF COMPLITER CORP. 3270 SNA EMULATOR Additional Product Classification: Communications/TP Monitors Specific Application: interactive Communication Setween 8860 and Host System Requirements: Nixdorf 8860: Dipos Memory Required: 512.0K bytes

Source Language: Assembler Purchase Terms: Rental Number Installed to Date: 5,000 HIXDORF COMPUTER CORP. 3770 SNA EMULATOR Additional Product Classification:

Communications/TP Monitors Specific Application: Batch Communications Between 8860 and Host System Requirements: Nixdorf 8860: Dipos

Memory Required: 512.0K bytes Source Language: Assembler Purchase Terms: Rental Number Installed to Date: 2,000

MORTHEAST DATACOM, INC.
TELECOMMUNICATIONS
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Telecommunications
System Requirements: Wang 2200
M/P: Speed
Memory Required: 28.0K bytes
Source Language: Basic II
Purchase Terms: Purchase (icense)
(See Vendor Profile Page V-22)

OFFICE EXPRESS, INC.
INTT 3270
Additional Product Classification:
Communications/TP Monitors
Specific Application: Software
interface for Terminal Monitor to
CICS Or Other Monitors
System Requirements: OS/VS1,
DOS/VS

Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license); Rental Number Installed to Date: 25 Date First Installed: 1982 (See Vendor Profile Page V-22)

ORION SOFTWARE, INC.
NETWORK ORION
Additional Product Classification:
Communications/TP Monitors
Specific Application: Connects IBM
System/34, 36, 38 With Telex
System/34, 36, 38 With Telex
System/34: SSP: IBM System/36;
IBM System/36: CFP
Memory Required: 96.0K bytes
Source Language: RPG-II,
Assembler
Source Code Available: No
Purchase Terms: Purchase (Icense);

Source Code Available: No Purchase Terms: Purchase (idense Rental; Lease - \$3,200 to \$10,000 Number Installed to Date: 120 Date First Installed: January 1982 (See Vendor Profile Page V-22)

PACER SOFTWARE GNET Additional Product Cleseification: Communications/TP Monitors Specific Application: Asynchronous (RS-232) Communications Between Local Prime Computer and Remote

System Requirements: Prime: Primos

Memory Required: 128.0K bytes Source Language: Fortran, PL/1 Source Code Available: Yes Purchase Terms: Purchase (license) -\$1,000 Date First Installed: September 1981

(See Vendor Profile Page V-22)

PACESETTER SYSTEMS, INC.
PACER/HPS-HOST PROCESSING
SYSTEM

Additional Product Classification: Communications/TP Monitors Specific Applications: Allows Bank to Communicate With IBM 370 Specific Industry: Banking/Financial System Requirements: IBM 370; IBM 430X: OS; IBM 430X: OS; IBM 430X: Source Language: Source Language: Cobol,

Assembler
Purchase Terms: Purchase (license);
Lease
Number installed to Date: 1
Date First Installed: 1982
(See Vendor Profile Page V-23)

PACIFIC SOFTWARE MANUFACTURING CO. X.DOT:PAD

X.DOT:PAD
Additional Product Classification:
Communications/TP Monitors
Specific Application: Interface from
Asynchronous Terminals to A
Packet-Switching Network
System Requirements: DEC VAX;
Motorola 6800; Zilog 28000
Memory Required: 64.0K bytes
Source Language: C
Purchase Terms: Purchase (license)
- \$40,000
Data First Installed: 1983
(See Vendor Profile Page V-23)

PACIFIC SOFTWARE
MANUFACTURING CO.
X.DOT:X.25
Additional Product Classification:
Program Generators/Alds,
Application Development Tools,
Communications/TP Monitors

Communications/TP Monitors
Spacific Application: C Language
Source Code Technology Transfer
Product
System Requirements: DEC VAX,
VMS; Motoroia 88000; Zsiog 28000;
Memory Required: 94.0% bytes
Source Language: O
Purchase Terms: Purchase (license)

Purchase Terma: Purchase (license - \$30,000 Number Installed to Date: 10 Date First Installed: 1981

PACIFIC SOFTWARE
MANUFACTURING CO.
X.DOT FOR UNIX
Additional Product Clearlication:
Program Generators/Aids,
Application Development Tools,
Communications/TP Monitors
Specific Applications: Interface from
Unix to Packet Switching, Supports
Remote Log-in, Call Out, File
Transfer, Mall
System Requirements: DEC VAX;
Motorola 88007, 2002 28000
Memory Required: 64.0't bytes
Source Language: C
Purchase Terms: Purchase (license)

Date First installed: 1983
PARTICIPATION SYSTEMS,

INC.
PARTICIPATE
Additional Product Classification:
Communications/TP Monitors,
DBMS

Specific Application: Computer Conferencing Package Including Electronic Mail and A Bulletin Board System Requirements: DEC VAX: VMS; Prime Series 50: Primos; Honeywell DPS6: GCOS; IBM: VMCMS, WMS/TSO Memory Required: 180.0K bytes Source Language: Pascal Purchase Terms: Purchase (license); Time-sharing - \$30,000 to \$60,000 Humber Installect to Date: 10 Date First Installect May 1982. See Vendor Profile Page 14-23)

PATHWAY DESIGN, INC.
PATHWAY/ISC.
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communication 3270/3770 Emulator
System Requirements: IBM PC,
MS-DOS, PC-DOS
Memory Required: 128.0K bytes
Source Language: C
Purchase Terms: Purchase (license)
- \$595
Date First Installed: September
1983
(See Vendor Profile Page V-23)

PATHWAY DESIGN, INC. PATHWAY/SNA Additional Product Classification: Communications/TP Monitors Specific Application: 3773/3270
Emulator
System Requirements: IBM PC, PC-DOS, MS-DOS
Memory Required: 128.0K bytes
Source Code Arelliable: No
Purchase Termis: Purchase (license)
- \$595
Delse First Installed: September

PEACHTREE SOFTWARE
TELECOMMUNICATIONS
Additional Product Cleasification:
Communications/TP Moretors
Specific Application: Program (Data
Communication)
Source Language: Assembler
Purchase Terms: Purchase (license)
- \$150
/See Vendor Profile Page V-23)

PEREGRIME SYSTEMS, IMC.
PMMS
Additional Product Classification:
Communications/T Monitors
Specific Application: Network
Management
System Requirements: IBM PC:
CPM; IBM 30XX: Unix, MS-005
Source Code Available:
Purchase Terms: Purchase (Iloense);
Rental; Lesse - \$250,000
Number Installed to Date: 2
Date First Installed: January 1980
(See Vendor Profile Page V-23)

PICKLES A TROUT
LYNG 3.9 COMMANICATIONS
SOFTWARE
Additional Product Classification:
Communications/TP Monitors,
System Resource Management
Specific Application:
Communications Software
System Requirements: CP/M
Memory Requirements
Source Code
Sourc

PLANNING DATA SYSTEMS TERM

Additional Product Classification: Communications/TP Monitors Specific Application: Specific Application: Communications Between Micros and Maintanue System Requirements: Televideo: CPM: Vector Graphics: CPM Miemory Required: 48.0K bytes Source Language: Fortran Source Sourc

POLYGON SOFTWARE CORP. INTERCOMM Additional Product Classification: Communications/TP Monitors Specific Application: Communications System Requirements: IBM 360/370: OS, VS, MVS Source Language: Assembler Purchase Terms: Purchase (license) - 375,000 Number installed to Date: 500 Date First Installed: September 1969 (See Verdor Profile Page V-24)

PRIME COMPUTER, INC. DPTX - INTERCONNECT FACILITY

FOR IBM 3270

Additional Product Classification: Communications (TP Monitors Specific Application: Communications Control and Facilitation System Requirements: Prime, Primos Source Code Araliable: No Purchase Terms: Purchase (Icense); Monthly License - \$7,500 Number Installed: 1979 (See Vendor Profile Page V-24)

PRIME COMPUTER, INC.
EM 200 UT-RULLATION FOR
CONTROL DATA UT 200
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulation Communication
System Requirements: Prime:
Primos
Source Code Available: No
Purchase Terms: Purchase (license);
Monthly License - \$3,750
Date First Installed: 1979

PRIMITE COMPUTER, INC.
EM 1004 - EMILATION FOR
UNIVAC 1004
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulation Communications/TP Monitors
System Requirements: Prime:
Primos
Source Code Available: NO
Purchase Terms: Purchase (ficense);
Monthly License - \$3,750
Date First Installed: 1979

PRIME COMPUTER, INC.
EM 7020 - EMULATION FOR ICL
7020 - EMULATION FOR ICL
7020 - Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulation Communication
System Requirements: Prime:
Primos
Source Code Available: No
Purchase Terms: Purchase (license);
Monithy License - \$3,750
Date First Installed: 1980

PRIME COMPUTER, INC.
EM GRTS - EMULATION FOR
HONEYWELL GRTS
Additional Product Classification:
Communication: Emulation Communication
System Requirements: Primo:
Primos
Source Code Available: No

Purchase Terms: Purchase (license); Monthly License - \$4,500 Date First Installed: 1979

PRIME COMPUTER, INC.
EM XBM - EMULATION FOR ICL.
XBM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emulation -

Communication System Requirements: Prime: Primos Source Code Available: No Purchase Terms: Purchase (license); Monthly License - \$3,750 Date First Installed: 1982

PRIME COMPUTER, INC. EMHASP - EMULATION FOR IBM HASP II

Additional Product Classification: Communications/TP Monitors Specific Application: Emulation -Communication System Requirements: Prims: Primos

Source Code Available: No Purchase Terms: Purchase (license); Monthly License - \$5,250 Date First installed: 1979

PRIME COMPUTER, INC.
EMX80 - EMULATION FOR IBM
2790/3780
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications - Emulation
System Requirements: Prime:
Primos
Source Code Available: No
Purchase Terms: Purchase (license):
Monthly License - \$4,500

Date First Installed: 1979

PRIME COMPUTER, INC.
FILE TRANSFER SERVICE
Additional Product Classification:
Communications/TP Monitors,
System Resource Management
Specific Application: Network File
Transfer Facility
System Requirements: Primo:
Primos
Source Code Available: No
Purchase Terms: Purchase (tionse);
Purchase Terms: Purchase (tionse);

Monthly License - \$2,000 Date First Installed: 1982

PRIME COMPUTER, INC.
PACKET NETWORK INTERFACE
Additional Product Classification:
Communications/IT Monitors
Specific Application:
Communications Control and
Facilitation
System Requirements: Prime:
Primos
Source Code Available: No
Purchase Terms: Purchase (license);
Morthly License - \$2,500
Date First Installed: 1979

PRIME COMPUTER, INC. PRIMENET - NETWORKING FACILITY ACILITY Communications/TP Monitors Specific Application:
Communications Control and
Facilitation - DOP Environment
System Requirements: Prime 50
Series: Primos
Souroé Code Available: No
Purchase Termis: Purchase (license);
Monthly License - \$7,500
Number Installed: 10 Date: 1,000
Date First Installed: 1979

PROGRAM RESOURCES, INC. WANG DEC LINK Additional Product Classification: Communications/T Monitors Specific Application: VT100 Emulation Package Source Language: Assembler Lang

PROTOCOL COMPLITER, INC.
PCITERM SI (UPCRADED
VERSION OF 5156 PLUS)
Additional Product Classification:
Communications/TP Monitors
Specific Application: Terminal
Emulation in Conjunction With
Protocol Conversion
System Requirements: iAS-DOS
Memory R

PROTOCOL COMPLITER, INC.
PCITERM 78 (UPGRADED
VERSION OF 7887 PLUS)
Additional Product Classification:
Communications/TP Monitors:
Specific Application: Terminal
Emulation in Conjunction With
Protocol Conversion
System Required: 128.0K bytes
Source Code Availables: Assembly
Source Code Availables: No Purchase Terms: Purchase (iconse)
- \$295
Number Installed to Dete: 5.000
Date First Installed: January 1983

QUADSTAR CORP.
AUDIO RESPONSE SYSTEM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Home Bill
Payment, Teller Assist Functions Via
Telephone
Specific Industry: Retail,
Barking/Financial
System Requirements: IBM Series/
1, EDX
Memory Required: 512.0K bytes
Source Language: Cobol
Source Code Available: No

Source Code Available: No Purchase Terms: Purchase (license) - \$75,000 Number Installed: to Date: 2 Date First Installed: 1981 (See Vendor Profile Page V-24)

# QUADSTAR CORP. AUTOMATED COLLECTION

Additional Product Classification: Communications/TP Monitors Specific Application: Automated Credit Card System and installment Loan Collection Activities Specific Industry: Retail, Banking/Financial System Requirements: IBM Series/ 1: EDX.

Memory Required: 512.0K bytes Source Language: Cobol Purchase Terms: Purchase (license); Rental; Lease - \$75,000 Number Installed: 1981 Date First Installed: 1981

QUADSTAR CORP. HOME BANKING SYSTEM

Communications/TP Monitors Specific Application: Personal Home Banking Specific Industry: Retail, Banking/Financial System Requirements: IBM Series/ 1: EDX Memory Required: 512.0K bytes

Memory Required: 512.0K bytes Source Language: Cobol Purchase Terms: Purchase (license); Rental; Lease - \$50,000 Number Installed to Data: 1 Date First Installed: 1983

# QUADSTAR CORP.

Additional Product Classification:
Communications/TP Monitors
Specific Application: Terminal
Network Management System
Specific Industry: Retail,
Banking/Financial
System Requirementa: IBM Series/
1: EDX
Memory Required: 512.0K bytes
Source Language: Cobol
Purchase Terms: Purchase (license);
Rental - \$200,000
Number Installied: 10 Date: 20
Date First Installied: 1979

### QUALITY SOFTWARE, INC. OS CALL Additional Product Classification

Communications/TP Monitors
Specific Application: Data Transfer
Via Telecommunications
System Requirements: IBM PC-XT:
MS-DOS, Mics 8000-2: CPfM: IBM
PC: MS-DOS 2.0
Memory Required: 64.0K bytes
Source Language: C
Source Code Available: No
Purchase Terms: Purchase (license)
-\$195
Date First Installed: January 1982
(See Vendor Profile Page V-24)

### QUALITY SOFTWARE, INC. QS SAM

Additional Product Classification: Communications/TP Monitors Specific Application: Utility for Transferring Text from Microcomputers to AM Typesetter System Requirements: IBM PC-XT: MS-DOS 2.0; Altos 8000: CP/M; IBM PC: MS-DOS 2.0 Memory Required: 48.0K bytes Source Lenguage: C Source Code Available: No Purchase Terms: Purchase (license) - \$795 Date First Installed: January 1982

RACET COMPUTERS, LTD.

MAGIC MAI.
Additional Product Classification:
Communications/TP Monitors
Specific Application: Electronic Mai
System Requirements: MEC PC8001, 8801: Racet NEC-PC8001, 880

RCS (ROZSA COMPUTER SYSTEMS), INC. SUPER COM Additional Product Classification: Communications/TP Monitors

Communications/TP Monitors
Specific Application:
Communications Package
System Requirements: IBM PC:
CP/M
Memory Required: 48.0K bytes

Source Language: C Source Code Available: No Purchase Terms: Purchase (license) - \$19,500 Number Installand to Date: 2

Number Installed to Date: 2 Date First Installed: 1982 (See Vendor Profile Page V-25)

### REAL-TIME MANAGEMENT, INC. REMOTE 990

Additional Product Classification: Communications/TP Monitors Specific Application: Allows TI 990S and Business Systems to Participate in Burroughs Pole Network

System Requirements: TI 300; TI 990 Memory Required: 192.0K bytes

Source Language: TI Assembly, Cobol, Tiform Purchase Terms: Purchase (license) - \$12,500

Date First Installed: 1978 (See Vendor Profile Page V-25)

# REDDING GROUP, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Micro to Micro Network Communications System System Requirements: IBM PC: CP/M

Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license) - \$500

(See Vendor Profile Page V-25)

REDDING GROUP, INC. ALPACA-PLUS - VERSION 2.56 Additional Product Classification: Communications/TP Monitors Specific Application: Micro-to-Micro Communications Link System Requirements: CP/M 80 Memory Required: 48.0K bytes Source Code Available: No Purchase Terms: Purchase (license)

Date First installed: 1980

# REDDING GROUP, INC.

ASYNCH
Additional Product Classification:
Communications/TP Monitors
Specific Application: Asynchronous
Communicator
System Requirements: IBM PC:
CPAA

Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license) - \$100

REDDING GROUP, INC. ASYNC - VERSION 3.01 Additional Product Classificat Communications/TP Monitors

Specific Application: Asynchronous Communications System Requirements: CP/M Memory Required: 48.0K bytes Purchase Terms: Purchase (license) - 5100 Date First Installed: 1979

# REDDING GROUP, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Overlay Linker System Requirements: IBM PC: CP/M

Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license) - \$250 to \$150

# REDDING GROUP, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Bisynchronous Electronic Mail System Requirements: IBM PC: CP/M

Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license)

### REDDING GROUP, INC. MICRO X.25

Additional Product Classification: Communications/TP Monitors Specific Application: Protocol for Communication



System Requirements: IBM PC: CP/M Memory Required: 48.0K bytes Source Language: Fortran
Purchase Terms: Purchase (license)

REDDING GROUP, INC. SYNCH 2780/3780 Additional Product Classification: Communications/TP Monitors Specific Application: Emulates Protocol for IBM Bisynchronous Micro to Mainframes System Requirements: IBM PC: CP/M Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license)

REDDING GROUP, INC. SYNCH 2780/3780 - VERSION 2.52 **Additional Product Classification:** Communications/TP Monitors Specific Application: Bisynchronous Communications Package System Requirements: CP/M Memory Required: 48.0K bytes Source Code Available: No Purchase Terms: Purchase (license)

Date First Installed: April 1979

REDDING GROUP, INC. **SYNCH 3270** 

Additional Product Classification Communications/TP Monitors Specific Application: Emulates IBM 3270 Protocol System Requirements: IBM PC: Memory Required: 48.0K bytes Source Language: Fortran Purchase Terms: Purchase (license)

REDDING GROUP, INC. SYNCH 3270 - VERSION 1.3 **Additional Product Classifica** Communications/TP Monitors Specific Application: Bisynchronous Communications System Requirements: CP/M Memory Required: 48.0K bytes Source Code Available: No nts: CP/M Purchase Terms: Purchase (license) - \$750

REMM SYSTEMS, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Asynchronous Telecommunications Software for CP/M 80 System Requirements: CP/M 80

Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) - \$195

Number installed to Date: 30 Date First installed: April 1982 (See Vendor Profile Page V-25)

REMOTE COMPUTING CORP. DIAL DATA

Additional Product Classification: Communications/TP Monitors,

Specific Application: Interfaces Micro With Mainframe Specific Industry: Banking/Financia System Requirements: IBM PC: PC-DOS; Apple Memory Required: 64.0K bytes Source Language: Basic Purchase Terms: Purchase (license)

\$100 Number Installed to Date: 1,000 Date First Installed: 1981 (See Vandor Profile Page V-25)

ROTI SYSTEMS SOFTWARE 3271/DD DEVICE DRIVER onal Product Classifi Program Generators/Aids Application Development Tools. Communications/TP Monitors Specific Application: IBM/RSX Communications Package System Requirements: DEC PDP-Source Language: Macro Purchase Terms: Purchase (license)

Number installed to Date: 2 Date First installed: 1982 (See Vendor Profile Page V-25)

RGTI SYSTEMS SOFTWARE RFX-11 VERSION II (FILE TRANSFER UTILITY) Additional Product Clas Program Generators/Aids Application Development Tools, Communications/TP Monitors cific Application: File Transfer and Virtual Terminal Utility System Requirements: DEC PDP-11, RSX; DEC VAX, VMS nory Required: 5.0K bytes Source Language: Macro Purchase Terms: Purchase (license) Number installed to Date: 300 Date First installed: 1980

RGTI SYSTEMS SOFTWARE SCREENSHARE-11 TERMINAL MONITOR FACILITY Additional Product Classification: Communications/TP Monitors Specific Application: Terminal Monitoring for Remote Support, Troubleshooting, Supervision and System Requirements: DEC PDP-11: RSX: DEC VAX: VMS Source Language: Macro Purchase Terms: Purchase (license) -\$1,250

Number installed to Date: 20 Date First Installed: 1981

ROTELCOM DATA, INC. SATURN-SPECIAL SERVICES AND TRUNK UTILIZATION Additional Product Classification Communications/TP Monitors Specific Application: Tracks Circuits and Trunk Utilization Specific Industry: Telephone Industry System Requirements: DEC VAX-11/780. VMS

Memory Required: 2.0M bytes Source Language: Fortran Purchase Terms: Purchase (license) Specific Application: Electronic Mail

Date First Installed: 1983 (See Vendor Profile Page V-26)

RTCS/REAL-TIME COMPUTER SCIENCE CORP PC/ENET VERSION 1.0 Additional Product Classificati Communications/TP Monitors Specific Application: Ethernet Application System Requirements: IBM PC

emory Required: 128.0K bytes Source Language: Object, PL/M Purchase Terms: Purchase (license) \$1,700

Number installed to Date: 3 Date First Installed: March 1983 (See Vendor Profile Page V-26)

RUF CORP. IMPRS COMMUNICATIONS SOFTWARE

Additional Product Classification: Communications/TP Monitors Specific Application: Communications
System Requirements: DEC: RSTS/E; DEC: RT-11, RSX-11, VMS, IAS

Memory Required: 28.0K bytes Source Language: Macro-11 Purchase Terms: Purchase (license) \$2,000

- \$2,000 Number Installed to Date: 7 Date First Installed: 1981 (See Vendor Profile Page V-26)

ENSIBLE SOFTWARE, INC. TELE-PORTER Additional Product Classification: Communications/TP Monitors Communication Package for Transfering Files and Diskettes Between Apples System Requirements: Apple: Apple-DOS Memory Required: 48.0K bytes

Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) - \$80 Number installed to Date: 100 Date First installed: July 1983 (See Vendor Profile Page V-26)

SGS SEMICONDUCTORS

CORP DEC VAX COMMUNICATIONS Additional Product Classification Communications/TP Monitors Specific Application: Electronic Mail for A DEC-VAX Based System System Requirements: DEC VAX: Unix, Sunix Memory Required: 512.0K bytes Source Language: Basic, Cobol,

Fortran , C Purchase Terms: Purchase (license) Number Installed to Date: 350 Date First Installed: January 1981 (See Vendor Profile Page V-26)

SGS SEMICONDUCTORS **HP 3000 COMMUNICATIONS** Additional Product Classificatio Communications/TP Monitors

for a HP 3000-Based System System Requirements: HP 3000, Unix, Sunix Memory Required: 512.0K bytes Source Language: Basic, Cobol, Fortran, C Purchase Terms: Purchase (license) Number Installed to Date: 350 Date First Installed: January 1981

CORP. IBM 3780 PROTOCOL Additional Product Classification: Communications/TP Monitors Specific Application: Electronic Mail System Requirements: IBM 3780, Unix. Sunix Memory Required: 512.0K bytes Source Language: Assembler, Cobol, Fortran , C Purchase Terms: Purchase (license) Number Installed to Date: 350 Date First Installed: January 1981

SQS SEMICONDUCTORS

**TELEX PLUX** Additional Product Classificatio Communications/TP Monitors Mail, Telex, D System Requirements: Unix, Sunix Memory Required: 512.0K bytes Source Language: Cobol, Fortran , C, Assembler Purchase Terms: Purchase (license)
Number Installed to Date: 350
Date First Installed: March 1983

SQS SEMICONDUCTORS TELEX PLUX Additional Product Classification: Communications/TP Monitors Specific Application: Electronic Mail, Telex System Requirements: Unix, Sur Memory Required: 512.0K bytes nte: Unix. Sunix

urce Language: Cobol, Fortran, C, Assembl

Purchase Terms: Purchase (license) Number Installed to Date: 350 Date First Installed: March 1983

SIMCON, INC. TELECON Additional Product Classification: Communications/TP Monitors Specific Application: Allows Mobile Terminals to Interface With State Or National Computer System Requirements: DG; HP;

Durango Memory Required: 256.0K bytes Source Language: Assembler, Fortran

Purchase Terms: Purchase (license) Number installed to Date: 1 Date First Installed: 1982 (See Vendor Profile Page V-27)

TELECOMMUNICATIONS INTERFACE Communications/TP Monitors Specific Application: Allows Police Departments to Talk to National Data Rasa Neiworks Specific Industry: Police System Requirements: HF MPE: DG CS 100: R-DOS: ota: HP 3000: Burroughs 1800/1900; DEC PDP-11 Memory Required: 256.0K bytes Source Language: Basic, Cobol Purchase Terms: Purchase (license); Lease - \$14,000 to \$20,000 Number Installed to Date: 15 Date First Installed: May 1982

SMART, INC. SERIES 1 POLLER & CREDIT AUTHORIZATION SYSTEM **Additional Product Classificat** Communications/TP Monitors Specific Application: Communication Between POS and Mainframe, Performs Credit **Authorization Functions** Specific Industry: Retail System Requirements: IBM Series/

mory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license) \$20,000 to \$80,000 Date First Installed: October 1983 (See Vendor Profile Page V-27)

# SMITH EDUCATIONAL ENGINEERING SERVICES,

ICOMM Additional Product Classification: Communications/TP Monitors Specific Application: Emulates Over 12 Terminals to Allow Access to Various Mainframes, Minis, and Other PCs System Requirements: IBM PC: PC-

Memory Required: 48.0K bytes Source Language: Basic, Assembler Source Code Available: No ase Terms: Purchase (license)

- \$150 Number Installed to Date: 1,000 Date First Installed: February 1982 (See Vendor Profile Page V-27)

### SOFTWARE AG OF NORTH AMERICA, INC. COM-PLETE

Additional Product Classification: Communications/TP Monitors Specific Application: Teleprocessing System

System Requirements: IBM System
370, MVS; IBM 43XX Series, OS-VS1; IBM 30XX Series, DOS/VSE Memory Required: 512.0K bytes Source Language: Assembler (See Vendor Profile Page V-27)

## SOFTWARE CLEARING HOUSE VIMOS

Additional Product Classification: Communications/TP Monitors Specific Application: Allows I Applications to Run Under V System Requireme Series, VRX mory Required: 41.0K bytes Source Language: VRX Cobol 74 Source Code Available: No Purchase Terms: Purchase (license):

Rental - \$9.500 Number installed to Date: 147 (See Vandor Profile Page V-27)

### SOFTWARE CLEARING HOUSE VIRTEX

Additional Product Classification: Communications/TP Monitors Specific Application: Utility VRX Teleprocessing Monitor includes Features Required to Develop New Systems from Scratch Under VRX System Requirements: NCR V Series, VRX Source Code Available: No Purchase Terms: Purchase (license): Rental - \$7,000 to \$17,000 fled to Date: 147

# SOFTWARE & COMMUNICATION CONCEPTS, INC. SOFTWARE & COMMUNICATIONS CONCEPT Additional Product Classification:

Communications/TP Monitors Specific Application: Complete Front End Software System Requirements: CDC, NOS Source Language: Modcom Purchase Terms: Purchase (license) \$100,000 mber installed to Date: 12 Date First installed: 1976 (See Vandor Profile Page V-27)

# SOFTWARE DEVELOPMENT & MAINTENANCE, INC. SDM/RPO ELECTRONIC REMOTE

Additional Product Classification Communications/TP Monitors Specific Application: Provides Electronic Purchase Order Interface Between Manufacturers and Retailers Specific Industry: Manufacturing System Requirements: Formation 4000: DOS/OS Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (license)

\$5,000 Number Installed to Date: 2 Date First Installed: 1980 (See Vendor Profile Page V-27)

# SOFTWARE DEVELOPMENT DAGAR DTS-3

Additional Product Classification: Communications/TP Monitors Specific Application: Transfer Files from One CP/M Based System to Another

System Requirements: CP/M Memory Required: 48.0K bytes Source Language: Cobol-80 Purchase Terms: Purchase (license) Date First Installed: February 1982 (See Vendor Profile Page V-27)

# SOFTWARE DYNAMICS MODEM Additional Product Classification:

Communications/TP Monitors cific Application: Remote Telephone Transmitter Through Telephone Links System Requirements: Motorcia: S-DOS, CP/M Memory Required: 32.0K bytes Source Code Available: No hase Terms: Purchase (license) - \$250 Number installed to Date: 10 Date First installed: January 1984 (See Vendor Profile Page V-27)

# SOFTWARE DYNAMICS

nal Product Classificati Communications/TP Monitors Specific Application: Shared Resources Microcomputer Network System Requirements: Paitech GT Series: S-DOS: TRS-80: CP/M: Motorola mory Required: 64.0K bytes Source Language: Assembly Purchase Terms: Purchase (license) \$200 Number installed to Date: 150 Date First installed: March 1983

## SOFTWARE MANAGEMENT SYSTEMS, INC.

MICROTALK Additional Product Classification Communications/TP Monitors Specific Application: Interface IBM PC OR Victor 9000 to Prime Computers

System Requirements: IBM PC: MS-DOS, PC-DOS; Victor 9000: MS-DOS, PC-DOS; Prime Computers:

Memory Required: 128.0K bytes Source Language: Info Basic V Source Code Available: No \$300

Number installed to Date: 2 Date First installed: July 1983 (See Vendor Profile Page V-27)

# THE SOFTWARE STORE

SOFTCOM -TELECOMMUNICATIONS UTILITY **Additional Product Classification** Communications/TP Monitors Specific Application: Telecommunications Utility for Smart Terminal and File Transfer System Requirements: CP/M Memory Required: 32.0K bytes Source Language: Machine Source Code Available: No nase Terma: Purchase (license) \$150 Number Installed to Date: 2,000 Date First Installed: 1980 (See Vendor Profile Page V-28)

# SOFTWARE SYSTEMS, INC. 5251 MODEL 12 WORK STATION **EMULATOR**

Additional Product Classification Communications/TP Monitors Specific Application: Enables IBM 5280 System to Operate On-Line to IBM System/34, System/36, System/38 System Requirements: IBM 5280:

Memory Required: 64.0K bytes

Source Language: 5280 Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$500 Number installed to Date: 150 Date First Installed: February 1982 (See Vendor Profile Page V-28)

# SOFTWARE SYSTEMS, INC. SYSTEM 34, 36, 38 EMULATOR

Additional Product Classification: Communications/TP Monitors Specific Application: File Transfer Station from System/34, System/36, System/38 to IBM 5280 System/34, System/36, System/38 urce Language: Assembler, RPGe Terms: Purchase (license)

\$350 to \$750 Number installed to Date: 50 Date First Installed: February 1982

SOFTWORKS, INC. VIRTUAL TERMINAL FACILITY Additional Product Classification Communications/TP Monitors Specific Application: Accesses Any Local 3270 Terminal Multiple Teleprocessing Programs System Requirements: IBM: OS Memory Required: 512.0K bytes Source Language: Assembler Purchase Terms: Purchase (license); Lease - \$7,500 Number Installed to Date: 25 Date First Installed: 1977 (See Vendor Profile Page V-28)

# SOUTHERN COMPUTER ISIS-CP/M

Additional Product Classification: Communications/TP Monitors Specific Application: Data Transfer from One Operating System to Another System Requirements: CP/M Memory Required: 16.0K bytes Source Language: Assembly Purchase Terms: Purchase (license) \$250 Number Installed to Date: 1,000 Date First Installed: 1979 (See Vendor Profile Page V-28)

# SOUTHWESTERN DATA SYSTEMS, INC.

ASCII EXPRESS II **Additional Product Classification:** Communications/TP Monitors Specific Application: Apple Communications Package System Requirements: Apple II, II+, IIE, DOS

Memory Required: 48.0K bytes Source Language: Assembly Purchase Terms: Purchase (license) . \$35 (See Vendor Profile Page V-28)

SOUTHWESTERN DATA SYSTEMS, INC.

ASCII EXPRESS THE PROFESSIONAL Additional Product Classification: Communications/TP Monitors

Specific Application: Apple-DOS Communication Package File Transfer, Supports Moderns System Requirements: Apple II, II+, IIE: DOS Memory Required: 48.0K bytes Source Language: Assembly Source Code Available: NO Purchase Terms: Purchase (Iconso)

### SOUTHWESTERN DATA SYSTEMS, INC. ONLINE

Additional Product Classification:
Communications/TP Monitors
Specific Application: Private Access
Dial-up System - Apples Equipped
With a Hayes Micromodern II
System Requirements: Apple II, II+,
IIE: DOS
Memory Required: 48.0K bytes
Source Code Aurellable: No

Purchase Terms: Purchase (license)

SOUTHWESTERN DATA
SYSTEMS, INC.
P-TERM THE PROFESSIONAL
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications Package for Pascal
System Requirements: Apple II, II+,
IE, USCD-P System
Memory Required: 48.0K bytes
Source Language: Assembly.

Pascal Source Code Available: No Purchase Terms: Purchase (license)

# SOUTHWESTERN DATA SYSTEMS, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Economical Terminal Package for CP/M Apple II With Microsoft 7-26 Soft Cape II With Microsoft 7-26 Soft Cape II III: CP/M Memory Requirements: Apple II, II+, III: CP/M

Source Language: Assembly Source Code Arailable: No Purchase Terms: Purchase (license) - \$100

SOUTHWESTERN DATA SYSTEMS, INC.

Z-TERM THE PROFESSIONAL Additional Product Classification: Communications/TP Monitor Specific Application: Apple CP/M Communications Package, Apples With Microsoft Z-90 Soft Card System Requirements: Apple II, IIE: Apple CP/M; Apple III Hitemory Required: 48.0K bytes Source Language: Assembly Purchase Terms: Purchase (license) - \$150

### SPARTACUS COMPUTERS, INC. KNFT

Additional Product Classification: Communications/TP Monitors Specific Application: Networking System Based on TCP IP ARPA Protocol System Regularements: IBM 4331:

VM Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) - \$15,000

Number installed to Date: 1 Date First installed: 1983 (See Vendor Profile Page V-28)

START SYSTEMS
AUTOPASS 3270TM
Additional Product Classification:
Communications/TP Monitors

Specific Application: Communications Interface Between Wang VS and 3270, Host Processor Interfaces With CMS, TSO, CICS, IMS

System Requirements: Wang VS Memory Required: 256.0K bytes Source Language: Object, Procedure Source Code Armilable: No Purchase Terms: Purchase (license)

- \$15,000 to \$80,000 Humber Installed to Date: 2 Date First Installed: January 1982 (See Vendor Profile Page V-28)

STRATUS COMPUTER, INC.
3270 EMULATOR FACILITY
Additional Product Cleasification:
Communications/TP Monitors
Specific Application: Facilities to
Connect Stratus Computer to IBM
Mainframe Using A Bisynchronous
Protocol
System Requirements: Stratus/32,
Stratus VOS
Source Language: PL/1
Source Code Available: No

Purchase Terms: Purchase (license) - \$5,000 Date First Installed: September 1982 (See Vendor Profile Page V-28)

STRATUS COMPUTER, INC. 3270 TERMINAL SUPPORT Additional Product Classification: Communications/TP Monitors Specific Application: Connects 3270 Terminal to A Stratus

Computer System Requirements: Stratus/32, Stratus VOS Source Lenguage: PL/1 Source Code Available: No Purchase Terms: Purchase (license) -54 000

Date First Installed: June 1982

STRATUS COMPUTER, INC. RJE-REMOTE JOB ENTRY

Rule-REMOTE JOB ENTRY
Additional Product Clessification:
Communications/TP Monitors
Specific Application: 2780/3780
Hasp Communications to Host
Computers
System Requirements: Stratus/32,
Stratus VOS
Source Language: PL/1
Source Code Available: No

Purchase Terms: Purchase (license) - \$3,000

Date First Installed: March 1982

# SUPERSOFT, INC.

Additional Product Classification:
Communication(TP Monitors)
Specific Application: Allows CP/M
Computer to Communicate With
Other Terminal Users and Other
Computers
System Requirements: CP/M
Memory Required: 32.0fc bytes
Source Language: C
Source Code Available: N
Purchase Terms: Purchase (license)
- \$200
(See Vendor Profile Page V-28)

SYSTAR CORP. GATEWAY 34/38 Additional Product Classification: Communications/TP Monitors Specific Application:

Communications Front-End Protocol Converter; X.25 Interface System Requirements: IBM Series/ 1 - 4955, CMX; IBM 4954; IBM 4956 Memory Required: 256.05 bytes Source Code Available: No Purchase Terms: Purchase (license) - \$22,000 to \$34,000 Number Installed: 15 Date: IT5 Date First Installed: 1981

(See Vendor Profile Page V-29)

SYSTAR CORP. GATEWAY/370

GATEWAY/370
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications Front-End Protocol
Converter; X.25 Interface
System Requirements: IBM
Series/1
Memory Required: 192.0K bytes
Source Language: Assembler
Source Code Available: No
Purchase Terms: Purchase (license)
- \$18.000

# SYSTAR CORP.

LODESTAR 34/38
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communications Front End System
System Requirements: IBM Series/

Memory Required: 384.0K bytes Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$40,000 Date First Installed: June 1982

THE SYSTEMS CENTER NETWORK ACCESS SERVICES CORVUS

Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows
Microprocessor Program to Attach to
Corvus, Omniet to Communicate to
SNA Processors
System Requirements: Corvus
Concept, CCOS; IBM PC, MS-DOS;
Apple Lisa: Lisa: 512.0K bytes
Source Language: Pascal

Source Code Available: No Purchase Terms: Purchase (license) Date First Installed: October 1983 (See Vendor Profile Page V-29)

# THE SYSTEMS CENTER NETWORK ACCESS SERVICESSERIES/1

Additional Product Clessification: Communications/TP Monitors Specific Application: Allows Series/ 1 EDX Programs to Communicate Upstream With SNA Host Processor System Requirements: IBM Series/ 1: EDX

Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) Date First Installed: October 1983

# THE SYSTEMS CENTER, INC. NETWORK DATAMOVER Additional Product Classification: Communications/TP Monitors

Communications/TP Monitors Specific Application: Manages The Transfer Of Information Between Controllers, Mainframe to Mainframe to Mainframe to Series/1; Mainframe to Micro

System Requirements: IBM PC, MS-DOS; Apple Lisa, Apple-DOS; IBM System 970: MVS; IBM System 970: MVS; IBM System Purchase (icense) Number Installed to Date: 10 Date First Installed: August 1983 (See Vendor Profile Page V-29)

# THE SYSTEMS CENTER, INC.

SNA ON MICRO COMPUTERS
Additional Product Classification:
Communications/TP Monitors
Specific Application: Supports Full
IBM SNA Data Communications
Memory Required: 100.0K bytes
Source Language: Pascal
Purchase Terms: Purchase (icense)
Date First Installed: May 1983

# SYSTEM & SOFTWARE, INC.

Additional Product Classification: Communications/TP Monitors Specific Application: Ties DEC PDP-11 or DEC VAX Together With Either on Intel MDS or MDS Under CP/M

- \$420 Number installed to Date: 100 Date First installed: September 1979

(See Vendor Profile Page V-29)

### SYSTEMS RESOURCES CORP. SIM 3278

Additional Product Classification: Communications/TP Monitors Specific Application: Protocal Converter for The IBM 3278 System Requirements: IBM 4300: VM MVS; IBM 308X; IBM 370 Source Language: Assembler Source Code Available: No Purchase Terms: Purchase (license) - \$6,500 Date First Installed: 1982 (See Vendor Profile Page V-29)

EYSTEMS STRATEGHES, INC.
2780/3760 EMULATOR
Additional Product Classification:
Communications/TP Monitors
Specific Application: Provides
2780/3780 Batch to IBM Mainframe
Source Language: C Code
Purchase Terms: Purchase (license)
-\$47,000
Number Installed to Date: 5
See Venior Profile Pace V-29)

SYSTEMS STRATEGIES, INC. 3270 BSC EMULATOR Additional Product Classification: Communications/TP Monitors Specific Application: Emulator 3270 BSC Device to IBM Mainframe Source Language: C Code Purchase Ferms: Purchase (icense) - 385,000 Number Installed to Date: 1

BYSTEMS STRATEGIES, INC.
3270 SNA EMILATOR
Additional Product Classification:
Communications/TP Monitors
Specific Application: Emission 3270
Cluster Controller to IBM Mainframs
Source Language: C Code
Purchase Terms: Purchase (icense)
-\$13,000
Number Installed to Date: 5
Date First Installed: 1978

SYSTEMS STRATEGIES, INC. X.25 INTERFACE
Additional Product Classification: Communications/TP Monitors
Specific Application: CDITT X.25
Standard Communications Interface
Source Language: C Code
Purchase Terms: Purchase (license)
- \$90,000
Number Installed to Date: 2

TAFT CORSULTING, INC.
TERRALINK
Additional Product Classification:
Communications/TP Monitors
Specific Application: Interess
Specific Application: Interess
Between Tandem and The Western
Linion Easy Linik
System Requirements: Tandem
Guardian
Source Code Available: No
Purchase Terms: Purchase (license)
- \$5,000
Date First Installect: 1983
See Vendor Profile Page V-29)

TECHNICO, INC.
SERIAL FILE TRANSFER
PROGRAM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Allows the
User to Upios and Download from A
Host Computer
Specific Industry: Education,
Scientific, Industrial Control
System Requirements: TI 9900
Memory Requirements: TI 9900
Memory Required: 4.0K bytes
Source Language: 9900 Assembler
Source Code Available: Yes

Purchase Terms: Purchase (license) - \$100 Number Installed to Date: 50 Date First Installed: 1982 (See Vendor Profile Page V-29)

TEKELEC, INC.
CHAMELEON ASYNC
Additional Product Classification:
Communications/TP Monitors
Specific Application: Stop-Start
Protocol Simulator
System Requirements: Chameleon
Data Communication
Memory Required: 64.0K bytes
Source Language: Assembly
Purchase Terms: Purchase (license)
-\$1,000
Number Installed: 1983
(See Vendor Profile Page V-30)

TEKELEC, INC.
CHAMELEON BASIC
Additional Product Classification:
Communications/TP Monitors
Specific Application: Simulator of
Byte Protocol
System Requirements: Chameleon
Data Communication
Memory Required: 64.0K bytes
Source Language: Assembly
Purchase Terms: Purchase (iconse)
- \$1,000
Number Installed: 1983
Date First Installed: 1983

TEKELEC, INC.
CHAMELECH BISYNC
Additional Product Classification:
Communications/TP Monitors,
Performance Measurement
Specific Application: Protocol
Modeling
Specific Industry: Manufacturing,
Engineering, Banking/Financial,
Government
System Requirements: Chemoleon
Source Code Availables: Chemoleon
Source Code Availables: (Iconse)
-\$1,000
Number Installed to Dete: 55
Dete First Installed: December 1982

TEKELEC, INC.
FRAME IFRAME LEVEL
EMULATOR)
Additional Product Classification:
Communications/TP Monitors,
Performance Measurement
Specific Application: Protocol
Modeling for Development and Test
Purposes
Specific Industry: Manufacturing,
Engineering, Banking/Financial,
Government, Network Support
System Requirements: Chameleon
Source Language: Proprietary
Source Code Available: No
Purchase Terms: Purchase (icense);
Rental, Lesso - \$1,000
Number Installed to Date: 55
Date First Installed: April 1982

TEKELEC, INC. FRANEM Additional Product Classification: Communications/TP Monitors Specific Application: HDLC/SDLC Protocol Simulator Memory Required: 64.0K bytes Source Language: Assembler Purchase Terms: Purchase (icense) - 51,000 Number installed to Date: 42 Date First Installed: 1982

TEKELEC, INC.
SIMP/I.
SIMP/I.
Additional Product Classification:
Communications/TP Monitors
Specific Application: SNA Protocol
Simulator
Memory Required: 64.0K bytes
Source Language: Assembly
Purchase Terms: Purchase (lionse)
- \$1,000
Number Installed: 1083
Date First Installed: 1983

TEKELEC, INC.
SIMPIL (SIMULATOR
INTERACTIVE MULTI-PROTOCOL
Additional Product Classification:
Communications/TP Monitors
Specific Application: Protocol
Modeling for Development and List
Specific Industry: Manufacturing,
Engineering, Banking/Financiel,
Government, Natwork
Support/Development
Source Code Avrailabler: No
Purchase Terms: Purchase (license)
-\$1,000
Number Installed: Deter: 55
Date First Installed: December 1982

TEKELEC, INC.
SITREX
Additional Product Classification:
Communications/TP Monitors
Specific Application: X.25 Network
and Subscriber Simulator
Hiemory Required: 64.0K bytes
Source Language: Assembler
Purchase Terms: Purchase (license)
- \$2.000
Number Installed: 1981
Date First Installed: 1981

TEKELEG, INC.
STITEX.P.LUS
Additional Product Classification:
Communications/TP Monitors
Specific Application: X.25 Protocol
Modeling
Specific Industry: Manufacturing,
Engineering, Banking/Financial,
Government, X.25 Network Support
Sourus Language: Proprietary
Purchase Terms: Purchase (license)
- \$1,00
Number Installed: March 1980
Date First Installed: March 1980

GENERAL COST ALLOCATION (GCA)
Additional Product Classification:
System Resource Management,
Communications/TP Monitors
Specific Application: Allocates
Telecommunications Costs to Users
Specific Industry: Manufacturing,
Engineering, Wholesale/Distribution,
Retail, Banking/Financial, Medical,

TELCO RESEARCH CORP.

Legal, Insurance, Real Estate,
Education, Construction,
Government, Transportation
System Requirements; IEM;
Honeyweit, DEC PDP: RSX-11M
Memory Required: 100.0K bytes
Source Language: Cobol
Purchase Terms: Purchase (isense) - 328,500
Date First Installed: April 1981
(See Vendor Profile Page V-30)

TELCO RESEARCH CORP.

MULTI-NODE TANDEN
OPTYMEZE (NTO)
Additional Product Classification:
Communications/TP Monitors
Specific Application: Design and
Optimize Multiple Location Switched
Networks
Specific Industry: Manufacturing,
Engineering, Wholessie/Distribution,
Retail, Benking/Financial, Medicial,
Legal, Insurance, Real Estate,
Education, Construction,
Government, Transportation
System Requirements: IBM; DEC
IO, DEC 20; DEC VAX: VMS; DG
MV8000
Memory Required: 100.0K bytes
Source Language: Fortran
Purchase Terms: Purchase (license)
Number Installed: 1978

TELCO RESEARCH CORP. THE ACD OPTYMIZER Additional Product Classific Communications/TP Monitors Specific Application: Communications Package Specific Industry: Manufacturing, Engineering, Wholesale/Distribution, Retail, Banking/Financial, Medical, Legal Insurance Real Estate Education, Construction, Government, Transporta System Requirements: IBM: OS/MVS: DEC 10: VM/CMS: DEC PDP-11 Source Language: Fortran. Assembly Purchase Terms: Purchase (license) \$27,500

TELCO RESEARCH CORP.
THE OPTYMIZER PLUS
Additional Product Classification:
Communications/TP Monitors
Specific Application: Network
Optimization
Specific Application: Network
Optimization
Specific Industry: Manufacturing,
Engineering, Wholesale/Distribution,
Retail, Banking/Financial, Medicial,
Legal, Insurance, Real Estate,
Education, Construction,
Government, Transportation
System Requirements: IBM; DEC
VAX: VMS; Honeywell; Amdahl
Source Language: Fortran
Purchase Terms: Purchase (license)
-\$28,800
Date First installed: 1978

TELCO RESEARCH CORP.
THE OPTYMIZER PLUS
Additional Product Classification:
Communications/TP Monitors

Specific Application: Network Optimization Specific Industry: Manufacturing, Engineering, Wholesale/Distribution, Fetal, Banking/Financial, Medical, Legal, Insurance, Real Estate, Education, Construction, Government, Transportation System Requirements: IBM; DEC VAX: VMS; Honeywel; Amdahl Source Language: Fortran Purchase Terms: Purchase (iloonse) - \$28,600 Date First Installed: 1978

TELCO RESEARCH CORP.
TRU DATA RECORDER/POLLER
Additional Product Classification:
Communications/TP Monitors
Specific Application: Data Capture
for Call Data!
Specific Industry: Manufacturing,
Engineering, Wholessie/Distribution,
Retail, Banidng/Financial, Medical,
Legal, Insurance, Education,
Construction, Government,
Transportation
System Requirements: IBM PC;
IBM PC-XT
Memory Required: 256.0K bytes
Purchase Terms: Purchase (license)
-\$12.500 to \$14.500

TELEPHONE SOFTWARE
CONNINCTION, INC.
ANSWERING MACHINE
Additional Product Classification:
Communications/TP Monitors
Specific Application: Answers
Modem Calls, Hardles Incoming
Outgoing Messages
System Requirements: Apple II, II+,
IIE: DOS 3.3
Memory Required: 48.0K bytes
Source Language: Applesoft
Source Language: A

TELEPHONE SOFTWARE
CONNEGETION, INC.
PHONE SECRETARY II
Additional Product Classification:
Communications: TP Monitors
Specific Application: Piscos Calis
and Keeps A Log of Activity
System Requirements: Apple II, II+,
III: DOS 3.3
Nemory Required: 48.0K bytes
Source Language: Appleont
W6502
Source Code Available: No
Purchase Terms: Purchase (license)

TELEPHONE SOFTWARE
CONNECTION, INC.
PICTURE TRANSFER PROGRAM
Additional Product Classification:
Communications/TP Monitor
Specific Application: Sands
Graphics Picture Over Phone
System Requirements: Apple III, II+,
IIE: DOS 3.3
Blemory Required: 48.0K bytes
Source Language: Applesoft
Purchase Termis: Purchase (ticonse)

TELEPHONE SOFTWARE
CONNECTION, INC.
TELEPHONE TRANSFER II
Additional Product Classification:
Communications/TP Monitors
Specific Application: Sends All DOS
3.3 File Types Over the Phone to
Another Apple
System Requirements: Apple II, II+,
IIE: DOS 3.3
Memory Required: 48.0K bytes
Source Language: Applesoft
W6502
Source Code Available: No
Purchase Terms: Purchase (license)

TELEPHONE SOFTWARE
CGANECTION, INC.
TERMINAL PROGRAM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Intelligent
Terminal Program With Automatic
Log On and 16K Capture Buffer
System Requirements: Apple 8I,
III-III: DOS 3.3
Memory Required: 48.0K bytes
Source Language: Applesoft
W6502
Source Language: Applesoft
W6502
Source Code Available: No
Purchase Termis: Purchase (iicense)

TEXAS INSTRUMENTS, INC. TERMINAL EMULATOR II Additional Product Classification: Communications/TP Monitors Specific Application: Terminal Emulation System Requirements: TI 99/4 Source Code Available: No Purchase Terms: Purchase (license) - \$50 (See Vandor Profile Page V-30)

TICOM SYSTEMS, INC.
REMCOM
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Comprehensive Asynchronous
Communications Puckage
System Requirements: IBM PC;
DEC Rainbow: UCSD-P; NEC APC;
TI
Memory Required: 64.0K bytes

Source Language: Pascal Source Code Available: No Purchase Terms: Purchase (license) - \$95 Date First Installed: 1981 (See Vendor Profile Page V-31)

TITM
TITN X.25 VERSION 1.0
Additional Product Classification:
Communications/TP Monitors
Specific Application: Provides
Minicomputer Access for Long-Haul
Data Network
System Requirements: Intel;
Fortune; Altos; Apolio
Memory Required: 64.0k bytes
Source Language: C
Purchase Terms: Purchase (license)
Number Installed: August 1983
(See Vendor Profile Page V-31)

THIN CORP.
PTINX
Additional Product Classification:
Communications/TP Monitors
Specific Application: Telex II (TWX)
Terminal Software
System Requirements: Commodors
Put
Memory Required: 8.0K bytes
Source Language: Basic
Purchase Terms: Purchase (Ilcense)
Humber Install

Additional Product Classification:
Processors
Ohio Scientific
Source Language:
Sasic
Purchase Terms: Purchase (Ilcense)
Humber Install

Additional Product Classification:
Processors
Ohio Scientific
Source Language:
Sasic
Purchase Terms: Purchase (Ilcense)

THW CORP.
XPTERM
Additional Product Classification:
Communications/TP Monitors
Specific Application: Smart
Terminal Software

Date First Installed: 1980

(See Vendor Profile Page V-31)

- \$99

System Requirements: Commodore Pet Memory Required: 32.0K bytes Source Language: Basic Purchase Terms: Purchase (license)

- \$49 to \$59 Date First installed: 1980

TOP DOWN SYSTEMS
INTF 3270
Additional Product Classification:
Communications/TP Monitors
Specific Application: Software
Interface for Terminal Monitor to
Another Systems Monitor
System Requirements: IBM: CP/M,
DOS, VS, M/S
Memory Requirem: 256.0K bytes
Source Language: Assembly
Purchase Terms: Purchase (license);
Rental; Lease - \$8,125
Date First Installed: 1982
(See Vendor Profile Page V-31)

TOP DOWN SYSTEMS
TERMINAL MONITOR
Additional Product Classification:
Communications/TP Monitors
Specific Application Programs
System Requirements: BiN: CPM,
DOS, VS, MVS
Memory Required: 256.0K bytes
Source Language: Assembly
Purchase Terms: Purchase ((icense);
Rental; Lease - \$39,375
[Rental; Lease - \$39,375

TOP DOWN SYSTEMS
VTAM 3270
Additional Product Classification:
Communications/TP Monitors
Specific Application: Interface for
Terminal Monitor to VTAM
System Requirements: IBM
Mainframes: CP/M, DOS, VS, MVS
Memory Required: 256, Ok bytes
Source Language: Assembly
Purchase Terms: Purchase (license);
Rental; Losse - \$3, 125
Number Installed: 10 Bate: 25
Date First Installed: 1980

TRANSACTION DATA SYSTEMS, INC. PACKET NETWORK FACILITY Additional Product Classification: Communications/TP Monitors Specific Application: Provides Interface Between Multiple Processors System Requirements: PE 3200, Ohio Scientific 32 Memory Required: 500.0K bytes Source Language: Assembly Purchase Terms: Purchase (ionese) - \$5,000 humber installed: 1979 (See Vexion Profile Page V-31)

TRANSACTION DATA
SYSTEMS, INC.
SYSTEMS, INC.
STAT-MUX SUPPORT FACILITY
Additional Product Classification:
Communication/FD Monitors
Specific Application: Provides A
Software Statistical Interface to
Remote Multiplaxers
System Requirements: PE 3200,
Ohio Scientific 32
Memory Required: 500 OK bytes
Source Language: Assembly
Puirchase Terms: Purchase (license)
- \$5,000
Number Installed to Date: 2
Date First Installed: 1981

TRAMSEND CORP.
TRANSEND I
Additional Product Classification:
Communications/TP Monitors
Specific Application:
Communication, Send and Receive
Messages
System Requirements: Apple II:
DOS; Apple III: DOS
Source Language: Assembly, Basic
Purchase Terms: Purchase (license)
- \$89
Number Installed to Date: 1,000
Date First Installed: 1981
(See Vendor Profile Page V-31)

TRANSEND II AND CORP.
TRANSEND II Additional Product Claseification:
Communications/TP Monitors
Specific Application: Send and Receive Messages, Verify File
Transfer
System Requirements: Apple II:
DOS; Apple III: DOS
Source Language: Assembly, Basic
Purchase Terms: Purchase (license)
- \$149
Number Installed to Date: 1.000
Date First Installed: 1981

TRANSEND III
TRANS

TRANSEND CORP.
TRANSEND III
Additional Product Classification:
Communications/TP Monitors

Specific Application: Electronic Mail System Requirements: Apple II: DOS; Apple IIE: DOS Source Language: Assembly, Basic Source Code Available: No se Terms: Purchase (license) - \$275

Number Installed to Date: 1,000 Date First Installed: 1983

TRANSEND CORP.

TRANSEND PC Additional Product Classification: Communications/TP Monitors Specific Application: Electronic Mail System Requirements: IBM PC:

Source Language: Assembly Source Code Available: No Purchase Terms: Purchase (license) Date First Installed: August 1983

UNIQUE AUTOMATION PRODUCTS
RJE REMOTE JOB ENTRY SOFTWARE

Additional Product Classification: Communications/TP Monitors Specific Application: Telecommunications System Requirements: DEC PDP-11, RSX, RT-11 Source Code Available: No Purchase Terms: Purchase (license)

\$1,850 to \$2,250 Number installed to Date: 100 Date First installed: January 1978 (See Vandor Profile Page V-32)

UNIQUE AUTOMATION PRODUCTS UAP-LINK

Additional Product Classification: Communications/TP Monitors Specific Application: Telecommunications File Transfer System Requirements: DEC PDP-11; IBM PC: PC-DOS; IBM 370, TSO Source Code Available: No Purchase Terms: Purchase (license) - \$250 to \$1,500 Number installed to Date: 50 Date First installed: July 1982

UNIQUE AUTOMATION PRODUCTS
UAP-LINK FILE TRANSFER
SOFTWARE Additional Product Classification: Communications/TP Monitors ecific Application: nunications File Transfer

System Requirements: DEC PDP-11: RT-11; DEC VAX: VMS; IBM PC, MS-DOS; IBM Mainframes: TSO Source Code Available: No Purchase Terms: Purchase (license) \$250

Number Installed to Date: 40 Date First Installed: June 1982

UNISOFT SYSTEM CORP. B-NET

**Additional Product Classification:** Communications/TP Monitors Specific Application: Networking System Requirements: Unix Memory Required: 156.0K bytes Source Language: C Purchase Terms: Purchase (license) - \$400

Number installed to Date: 10 Date First installed: March 1983 (See Vendor Profile Page V-32)

UNIVERSITY COMPUTING CO. UCC MBA-MICROCOMPUTER SOFTWARE

Additional Product Classification Financial Modeling Languages/DSS, WP/Text Editing, DBMS, Graphics, Communications/TP Monitors Specific Application: Spreadsheet Modeling, Graphics, WP, Data Base Forms Generation

Specific Industry: Manufacturing System Requirements: IBM PC: MP

Memory Required: 256.0K bytes Source Code Available: No Purchase Terms: Purchase (license) Number installed to Date: 2,000 (See Vandor Profile Page V-32)

USMA COMPUTER CO.

COMMUNICATIONS PACKAGE Additional Product Classification Communications/TP Monitors Specific Application: Asynchronous Communications With an IBM PC and Hayes Smart Modern, Supports 132 Column Reports System Requirements: IBM PC, PC-

Memory Required: 64.0K bytes Source Language: Basic Purchase Terms: Purchase (license) \$200

Number installed to Date: 3 Date First installed: January 1983 (See Vendor Profile Page V-32) USMA COMPUTER CO. Additional Product Classification

BM PC COM

Communications/TP Monitors Specific Application: Communication With Time-sharing Firms and Data Bases System Requirements: IBM PC: PC-

Memory Required: 64.0K bytes Source Language: Basic Source Code Available: Yes Purchase Terms: Purchase (license) - \$200 Number Installed to Date: 5 Date First Installed: January 1983

VAN AMBURG & ASSOCIATES,

TAC SOFT

Additional Product Classification: Communications/TP Monitors Specific Application: User-Defined Technical Assistance Center Support Package Supports Maintenance of Company and PBX Switching Equipment

Specific Industry: Telephone System Requirements: DG Eclipse: AOS

Memory Required: 760.0K bytes Source Language: SP/Pascal, Assembler Assember
Purchase Terms: Purchase (license)
Number Installed to Date: 1
Date First Installed: 1983
(See Vendor Profile Page V-32)

VISICORP

VISIANSWER Additional Product Classification: Communications/TP Monitors pecific Application: Communications Package
System Requirements: IBM PC: PC-DOS ase Terms: Purchase (license)

(See Vendor Profile Page V-32)

VISITERM Additional Product Classifica System Resource Management. Communications/TP Monitors Specific Application: Terminal Emulation, Product Turns PC into **Dumb Terminal** System Requirements: Apple II, III: Apple-DOS; IBM PC: PC-DOS; Commodore; Atari 800 Purchase Terms: Purchase (license)

WILD HARE COMPUTER SYSTEMS, INC. HARE/NET

Additional Product Classification Commitmentions/TP Monitors Specific Application: Local-Area Network Software System Requ Work Station: MCS Source Code Available: No se Terms: Purchase (license) \$2,000 Number Installed to Date: 4 Date First Installed: June 1983 (See Vendor Profile Page V-33)

WINTERHALTER, INC. NS3270 AND NS3780 Additional Product Clar Communications/TP Monitors Specific Application: Micro to Mainframe Communications Programs (Emulation) System Requirements: CP/M Memory Required: 56.0K bytes Source Language: C Source Code Available: \$8,000 Purchase Terms: Purchase (lice (See Vendor Profile Page V-33)

ZAIAZ COMMUNICATIONS,

TRANSLATION EXPRESS Additional Product Classifica Communications/TP Monitors Specific Application: Intercomputer File Transfer System Requirements: Televideo: CP/M; DEC VAX: VMS; DEC PDP-11/23: Unix; TI 990: DSX Source Language: C Purchase Terms: Purchase (license) \$500 Number Installed to Date: 23 Date First Installed: March 1982 (See Vendor Profile Page V-33)

ZIMON ASSOCIATES, INC.

TAP Additional Product Classification: Communications/TP Monitors Specific Application: Traffic Analysis Program, Communication Network Design Specific Industry: Telecommunications System Requirements: CP/M lemory Required: 56.0K bytes Source Language: Cobol, Basic, Assembler Purchase Terms: Purchase (license); Rental; Lease - \$1,000 Number installed to Date: 12 Date First installed: 1979 (See Vendor Profile Page V-33)

FACSIMILE DEVICES

# **Index to Facsimile Devices**

Facsimile devices are systems which are used for the transmission of images. There are three basic types of facsimile devices — transmitters, receivers and transceivers, which can both send and receive images. The index listings are arranged alphabetically by vendor and include the price, device type and the page number on which the complete product listing can be found.

VENDOR	MODEL 1	TRANSMISSION TECHNIQUE		PRICE	PAG
Alden Electronics, Inc.	18 X 22 FACSIMILE SYSTEM	. Stand-alone Transmitter		\$11.750	C4
	SIGMA FAX	. Stand-alone Transmitter		\$5,600	C-4
Burroughs Corp	DEX 1103	Transceiver		\$1,500	C-4
	DEX 1402	Transceiver		\$2.000	C-4
	DEX 2100	Transceive		\$2,995	C-4
	DEX 3200	Transceive		\$3,995	C-4
	DEX 3500	Transceive		\$3.500	04
	DEX 3600	Transceive		\$3,995	C-4
Canon U.S.A., Inc	FAX 31				04
	FAX 320E	Transceive		\$5,995	C-4
	FAX 330	Transceive		\$4,495	04
	FAX 401				. C-4
Exxon Exterprises	1200				. C-4
	1300 QWIP				C
	2000/2150				C-4
	2210 QWIP				C-1
	2310 QWIP				04
infolink	DIAL ACCESS RECEIVER				C
	DIAL ACCESS TRANSMITTER				C
	PRIVATE LINE TRANSMITTER				C
Mitsubishi Electronics America, Inc	FA-585G				
HEC Telephone, Inc.	NEFAX 3C				C
nac reseptione, Inc					
	NEFAX 3S				
	NEFAX 3SE				
	NEFAX 3SH				
	NEFAX 3T				
	NEFAX 8		·		
Panafax Corp	MV-1200				
	MV-3000		·		
	MV-3000WL				
	PX-100			\$4,495 .	C
Pitney Bowes	8300				C
	8400	Transceive	·	\$4,995 .	C-
	8500				
	8600	Transceive	r	\$6,995 .	C
	8800	Transceive		\$8,995 .	C
Rapicom, Inc	3100	Transceive	r	\$3,795 .	C
	3300	Transceive	r	\$5,000 .	C
*	5000	Transceive	r	\$9,950 .	C
	6100	Transceive	r	\$5,000 .	C
· ·	6300	Transceive	r	\$7.840 .	C.
	6300R	Receive		\$4.450	C-
	6350				C-
Sanyo Buainess Sys. Corp	SF 615				
	SF 625				
	SF 935				C-
Telestograph Corp.	G21				
	G32				
,	G39				
	G96				
	G99				6
Xerox Corp.	TC 295				C
Natur Carps	TC 400				0
	TC 455				0
	TC 485				
					0
	TC 495-1				
JM GO	608				
	611				C
	1000		r		C-
	2700				C
	9140		f		C
	9145	Transceive		\$3,700 .	C-
	9165				C

# **Facsimile Devices**

ALDEM ELECTRONICS, INC. 18 X 22 FACSIMILE SYSTEM Device Type: Stand-alone Transmitter, Receiver Transmission Signat: Analog Graphics Capability: Yes Price: \$11,750 Date First Installact: Sentember

(See Vendor Profile Page V-1)

ALDEN ELECTRONICS, INC. SIGMA FAX Device Type: Stand-alone Transmitter, Receiver Transmission Signal: Analog Graphica Capability: No Price: \$5,000

BURROUGHS CORP.
DEX 1103
Device Type: Transceiver
Transmission Signal: Analog
Graphics Capability: Yes
Price: \$1,500
Date First Installed: June 1978
(See Vander Profile Page V-4)

BURNOUGHS CORP.
DEX 1402
Device Type: Transceiver
Transmission Signal: Analog
Graphica Capability: Yes
Price: \$2,000
Date First Installed: June 1979

BURROUGHS CORP.
DEX 2100
Device Type: Transceiver
Transmitesion Signal: Analog
Graphics Capability: Yes
Price: \$2,995
Date First installed: September
1981

BURROUGHS CORP.
DEX 3200
Device Type: Transceiver
Transmission Signal: Digital
Graphics Capability: Yes
Price: \$3,995
Date First Installed: November 1983

BURROUGHS CORP.
DEX 3500
Device Type: Transceiver
Transmission Signal: Digital
Graphics Capability: Yes
Price: \$3,500
Date First Installed: September
1982

BURROUGHS CORP.
DEX 3800
Device Type: Transceiver
Transmission Signal: Digital
Graphics Capability: Yes
Price: \$3,95
Date First installed: September

CANON U.S.A., INC. FAX 31 Device Type: Transceiver Transmission Signal: Analog Graphica Capability: No Price: \$1,995 Date First Installed: June 1963 (See Vandor Profile Page V-5) CANON U.S.A., IMC. FAX 320E Device Type: Transceiver Transmission Signat: Analog, Digital Graphica Capability: Yes Price: \$5,950 Data First Installed: January 1984

CANON U.S.A., INC. FAX 330 Device Type: Transceiver Transmission Signat: Analog, Digital Graphica Capability: Yes Price: \$4,495 Date First installed: September 1983

CANON U.S.A., INC. FAX 401 Device Type: Transceiver Transmission Signal: Analog, Digital Graphics Capability: Yes Price: \$3,750 Date First Installed: January 1981

EXXON ENTERPRISES
1200 Device Type: Transceiver
Transmission Signet: Analog
Graphice Capability: Yes
Price: \$1.495
Date First Installed: December 1975
(See Vendor Profile Page V-12)

EXXON ENTERPRISES
1300 QWIP
Device Type: Transceiver
Transmission Signal: Analog
Graphics Capability: Yes
Price: \$1,495
Date First installed: July 1978

EXXON ENTERPRISES 2000/2150 Device Type: Transceiver Transmission Signal: Analog Graphica Capability: Yes Price: \$2,375 to \$3,375 Date First installect February 1980

EXXON ENTERPRISES 2210 CWIP Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$2,955 Date First Installed: 1983

EXXON ENTERPRISES
2310 CWIP
Device Type: Transceiver
Transmission Signal: Digital
Graphics Capability: Yes
Price: \$5,845 to \$6,745
Date First Installed: June 1982

INFOLINK
Device Type: Receiver
Transmission Signat: Analog, Digital
Graphics Capability: Yes
Price: \$500
Date First Installed: January 1970
(See Vendor Profile Page V-15)

INFOLINK
DIAL ACCESS TRANSMITTER
Device Type: Stand-alone
Transmitter

Transmission Signal: Analog, Digital Graphics Capability: Yes Price: \$500 Date First Installed: January 1970

INFOLINK
PRIVATE LINE RECEIVER
Device Type: Receiver
Transmission Signal: Analog, Digital
Graphics Capebility: Yes
Price: \$500
Date First installed: January 1970

INFOLINK
PRIVATE LINE TRANSMITTER
Device Type: Transceiver
Transmission Signal: Analog, Digital
Graphics Capability: Yes
Price: \$500
Date First installed: January 1970

MITSUBBENI ELECTRONICS AMBERICA, INC., FA-585G Device Type: Transceiver Transmission Signal: Digital Graphica Capability: Yes Price: \$5,000 Date First Installed: January 1982 (See Vendor Profile Page 1-20)

NEC TELEPHONE, INC. NEFAX 3C Device Type: Transceiver Transmission Signat: Digital Graphics Capability: Yes Price: \$11,500 Date First installed: January 1981 (See Vendor Profile Page V-21)

MEG TELEPHONE, INC. NEFAX 3S Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$4,400 Data Sire! Installad: Juna 198

NEC TELEPHONE, INC. NEFAX 38E Device Type: Transceiver Transmission Signat: Digital Graphica Capability: Yes Price: \$4,600 Date First Installed: June 1983

NEC TELEPHONE, INC. NEFAX 35H Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$4,600 Date First Installed: June 1983

NEC TELEPHONE, INC. NEFAX 3T Device Type: Transceiver Transmission Signal: Digital Graphice Capability: Yes Price: \$6,200 Date First Installed: June 1981

NEC TELEPHONE, INC. NEFAX 8 Device Type: Transceiver Transmission Signet: Digital Graphice Capability: Yes Price: \$2,100 Date First Installed: October 1983 PANAFAX CORP. MV-00 Device Type: Transceiver Transmission Signal: Analog Graphica Capability: Yes Price: \$1,975 Date First Installed: September

(See Vendor Profile Page V-23)

1978

MV-3000 Device Type: Transceiver Transmission Signet: Digital Graphics Capability: Yes Price: \$6,250 Date First Installed: May 1982

PANAFAX CORP. MV-3000WL Device Type: Transceiver Transmission Signat: Digital Graphica Capability: Yes Price: \$7,000 Date First Installed: May 1982

PANAFAX CORP.
PX-100
Device Type: Transceiver
Transmission Signal: Digital
Graphica Capability: Yes
Price: \$4.495
Date First Installed: June 1983

PITNEY BOWES
8300
Device Type: Transceiver
Transmission Signal: Analog
Graphics Capability: Yes
Price: \$2,995
Date First Installed: September
1982
(See Vendor Profile Page V-24)

PITNEY BOWES
8400
Device Type: Transceiver
Transmission Signal: Analog
Graphics Capability: Yes
Price: \$4,995
Date First Installed: September

PITNEY BOWES

5500
Device Type: Transceiver
Transmission Signal: Analog, Digital
Graphics Capability: Yes
Price: \$4,695
Date First Installed: September
1983

PTTHEY BOWES
8800
Device Type: Transceiver
Transmission Signat: Ar alog, Digital
Graphics Capability: Yes
Price: \$6,995
Date First installed: September
1982

8800
Device Type: Transceiver
Transmission Signal: Analog, Digital
Price: \$8,995
Date First installed: September
1982

PITNEY BOWES

# Learn more about Personal Computing, Office Automation or Communications in these video journals from CW Communications and Deltak.

Personal Computing:
A Business Perspective

Taped on location during CW Communications' COMPUTERWEEK conference, these six video sessions feature many of the biggest names in the microcomputer industry as they share their insights into the application of personal computers in the business environment. Each of the six tapes is 20-30 minutes long, and focuses on a specific issue. Available through Deltak singly or as a group.

- · Thinking Small for Big Business
- · The Purchase Decision
- Finding a Vendor
- · Sales Trends and IBM
- · New Languages and Networking
- A Look Toward the Future

Office Automation: The Essential Issues

Last Fall, executives from around the country attended the OA Forum, a national conference conducted by CW Communications on the introduction, integration and implementation of office automation in today's business environment. Leading industry experts and top corporate managers discussed key office automation planning issues. These discussions are now available to you in seven carefully edited conference journals. Each journal is in full color, and 20-30 minutes long. They are available from Deltak singly or in a group.

- · The DP Role in Office Automation
- · Planning for Office Automation
- The Fundamentals of Integration
- · Some Specifics of Integration
- The Executive Workstation
- One Company's Experience
- Introducing Office Automation to Your Organization

# Communications

Leading experts in all areas of communications were taped at the 1983 Communication Networks Conference in New Orleans. The result was two brand new video conference journals of key

interest to all levels of corporate and technical understanding:

- Communication Networks: Alternatives for the 80's
- Local Area Networks: The major considerations

All of these useful journals are available through Deltak, inc., 1751 Diehl Road, Naperville, IL 60566. To get more information, or to find out about rentals, just call Deltak Order-Entry at (312) 369-3000 (in Canada, (416) 678-9222), or check the white pages of your telephone directory for the Deltak office nearest you.





# **Facsimile Devices**

RAPICOM, INC.

Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$3,795 Price: \$3,795 Date First Installed: January 1982 (See Vendor Profile Page V-25)

### RAPICOM, INC.

3300 Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$5,000 Date First Installed: January 1982

# RAPICOM, INC.

5000
Device Type: Transceiver
Transmission Signet: Digital
Graphics Capability: Yes
Price: \$9,950

# RAPICOM, INC.

6100 Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$5,000 Date First Installed: October 1981

### RAPICOM, INC.

6300 Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$7,840 Date First Installed: January 1981

# RAPICOM, INC.

6300R Device Type: Receiver Transmission Signal: Digital Graphics Capability: Yes Price: \$4,450 Date First Installed: January 1981

# RAPICOM, INC.

6350 Device Type: Stand-alone Transmitter Transmission Signal: Digital Graphics Capability: Yes Price: \$4,420

Date First installed: January 1981

# BANYO BUSINESS SYSTEMS

SF 615 Device Type: Transceiver Transmission Signst: Analog, Digital Graphics Capability: Yes Date First Installed: March 1984 (See Vendor Profile Page V-26)

# SANYO BUSINESS SYSTEMS

SF 625 Device Type: Transceiver Transmission Signal: Analog, Digital Graphics Capability: Yes Date First Installed: March 1984

# SANYO BUSINESS SYSTEMS SF 935

Device Type: Transceiver Transmission Signal: Analog, Digital Graphics Capability: Yes Price: \$4,700 Date First Installed: 1983

# TELAUTOGRAPH CORP.

Device Type: Transceiver Transmission Signal: Analog Graphics Capability: Yes Price: \$2,100 (See Vendor Profile Page V-30)

# TELAUTOGRAPH CORP.

G32 Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$3,500 Date First Installed: January 1981

# TELAUTOGRAPH CORP.

Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$4,500 Date First Installed: January 1983

# TELAUTOGRAPH CORP.

Device Type: Transceiver

Transmission Signel: Digital Graphics Capability: Yes Price: \$6,000 Date First Installed: January 1982

# TELAUTOGRAPH CORP.

G99
Device Type: Transceiver
Transmission Signal: Digital
Date First Installed: March 1984

## XEROX CORP.

TC 295 TC 295
Device Type: Transceiver
Transmission Signat: Digital
Graphics Capability: Yes
Price: \$4,600
Date First Installed: October 1983
(See Vandor Profile Page V-33)

TC 400
Device Type: Transceiver
Transmission Signal: Analog
Graphics Capability: Yes
Price: \$1,695 Date First Installed: January 1971

# XEROX CORP.

TC 455 Device Type: Transceiver Transmission Signal: Analog Graphics Capability: Yes Price: \$2,195 Date First Installed: June 1981

TC 485 Device Type: Transceiver Transmission Signal: Analog Graphics Capability: Yes Price: \$4,195 Date First Installed: August 1979

# XEROX CORP.

TC 495-1 Device Type: Transceiver Transmission Signal: Digital Graphics Capability: Yes Price: \$6,700 Date First Installed: June 1981

608 Device Type: Transceiver Transmission Signal: Analog, Digital Graphics Capability: Yes Price: \$1,995 Date First Installed: June 1979 (See Vendor Profile Page V-34)

### am co.

811 Device Type: Transceiver
Transmission Signel: Analog, Digital
Graphics Capability: Yes
Price: \$4,450
Date First Installed: June 1981

# 3M CO.

Device Type: Transceiver Transmission Signal: Analog Graphics Cepability: Yes Price: \$2,550

## 3M CO.

2700 2700
Device Type: Transceiver
Transmission Signal: Analog, Digital
Graphics Capability: Yes
Price: \$4,450
Date First Installed: June 1981

# 3M CO.

9140 u140
Device Type: Transceiver
Transmission Signal: Analog, Digital
Graphics Capability: Yes
Price: \$2,600 Date First installed: June 1982

# 3M CO.

9145 Device Type: Transceiver Transmission Signal: Analog, Digital Graphics Capability: Yes Price: \$3,700 Date First Installed: December 1983

# 3M CO.

9165 Device Type: Transceiver Transmission Signel: Analog, Digital Graphics Capability: Yes Price: \$6,500 Date First Installed: May 1983

TRANSMISSION SERVICES VENDORS

A. W. COMPUTER SYSTEMS, INC.

Woods Rd. Rt.#38 Cherry Hill, NJ 08002 (609) 779-7200 Major Market: Communications Equipment Manufacturing; OEM (Computer Systems); Systems House (Commercial OEM): Retail Store Product Lines: Microwave Services; Satellite Services; Long Lines (MCI, Sprint, Bell): Microwave Equipment: Laser Not Sales: \$1 Million - \$5 Million Contacts Head of Marketing: Di Simone Head of Software: Mike Greenblatt Head of Engineering: Charles Welch Head of Customer Service: Andy Nye

ADDA CORP.

130 Knowles Drive
Los Gatos, CA 95030
(409) 379-1500
Major Market Communications
Equipment Manufacturing
Product Lines Digital Termination
Services; Cellular Radio
Certacte:
Head of Marketing/Sales: Ron Frie

Geographic Coverage: International Year Established: 1973

nber of Employees: 17

Centacta: Head of Marketing/Sales: Ron Fried Head of Engineering: Dan Maase Geographic Coverage: International Year Established: 1977 Number of Employees: 150

AETHA TELECOMM LABS
131 Fländers Road
Westborn, MA 01581
Mejor Market: Component and
Communications Equipment
Manufacturing
Product Linest: Fiber Optic
Contacts:
Head of Marketing/Sales: Marjorie
Kattz
Head of Engineering: Leon Woo
Geographic Coverage: International
Year Established: 1981
Number of Employees: 50

AMERICAN PHOTONICS, INC.
71 Commerce Road
Provided, CT 06804
(203) 775-9850
Major Markets Communications
Equipment Manufacturing
Product Lines: Fiber Optic
Contacts:
Head of Marketing: Scott Sideman
Geographic Coverage: Informational
Year Established: 1981
Number of Employees: 20

AMERICAN SUN MOON STAR, INC. 10440 Tantau Ave. Cupertino, CA 95014 (408) 255-281 Major Merket: Communications Equipment Menufacturing Product Lines: Microwave Services; Satellite Services; Long Lines (MCI, Sprint, Bell), Digital Termination Services; Satellite Equipment Contacta: Head of Engineering: Jim Baichtal Geographic Coverage: International Year Established: 1981 Number of Employees: 20

ARTEL COMMUNICATIONS
CORP.
W. Side Station
P.O. Box 100
Worcester, MA 01602
(617) 782-5890
Major Market: Communications
Equipment Manufacturing
Product Linear Fiber Optic
Contacts:
Head of Marketing: Harry Jain
Head of Sales: John Bleisvarki

Head of Sales: John Bielawski Head of Engineering: Russell Patterson Geographic Coverage: International Year Established: 1980 Number of Employees: 40

ASCH & BAUDOT TECHNICAL SERVICES 11300 Hartland St. N. Hollywood, CA 91605 (213) 799-977. Major Market OEM (Peripherals-Terminals), Maintenance/Other Services Product Lines: Fiber Optic; Laser Year Established: 1983 Number of Employees: 10

BBJED, INC.
4824 N.E. 42nd.
Portland, OR 97218
(503) 281-8153
Major Markets Communications
Equipment Manufacturing
Product Lines: Digital Termination
Sorvices
Contacts:
Head of Marketing/Sales: Richard C.
Chamberlin
Head of Engineering: Bill Johnson
Geographic Coverage: International
Year Established: 1972
Number of Employees: 9

CANOGA DATA SYSTEMS
21218 Van Owen St.
Canoga Park, CA 91303
(219) 888-2003
Major Market: Communications
Equipment Manufacturing
Product Lines: Fiber Optic
Contacts:
Head of Sales: Jack Miller
Head of Engineering: Mas NaKamori
Geographic Coverage: International
Year Established: 1978
Number of Employees: 110

ICHROWOMETRICS
9155 Brookville Rd.
9155 Brookville Rd.
(301) 587-3507
Major Markeut: Communications
Equipment Manufacturing; System
Manufacturing; Contacts:
Head of Marketing: Homev Guerra
Geographic Coverage; National
Year Established: 1977
Number of Employees: 10

COASTCOM
2312 Starwell Drive
Concord, CA 94520
(415) 825-7500
Major Market: Component and
Communications Equipment
Manufacturing
Product Lines: Satellite Equipment
Contacts:
Head of Marketing/Sales: William
Martin.

Martin Head of Sales: William Martin Head of Engineering: Toney Warren Head of Customer Service: Paul Rivard Geographic Coverage: International Year Established: 1969 Number of Employees: 95

CODENOLL TECHNOLOGY CORP.

1086 N. Broadway
Yonkers, NY 10701
(914) 965-6300
Melor Market: Communications
Equipment Manufacturing;
Maintenance/Other Services
Product Lines: Fiber Optic; Laser
Contacts:
Head of Marketing/Sales: Mike
Coden
Head of Sales: Mike Coden
Head of Sales: Mike Coden
Head of Sales: Mike Coden
Head of Engineering: Dr. Frederick
Scholl
Geographic Coverage: International
Year Established: 1980
Number of Employees: 50

COMPRE COMMs, INC.
3200 N Farber Dr.
Champaign, IL. 61821
(217) 352-2477
Major Market: Communications
Equipment Manufacturing
Product Lines: Satelities Equipment
Net Sales: \$1 Million - \$5 Million
(1982)
Contacts:
Head of Marketing: Ron Sockel
Head of Sales/Engineering: Andrew
B. White
Head of Software: Michael Sacre
Geographic Coverage: International
Year Established: 1977
Number of Employees: 40

CONTROL MODULE, INC.
380 Enfleid St.
Enfleid, CT 06082
(203) 745-2433
Major Market: Peripheral and
Communications Equipment
Manufacturing; Systems House
(Commercial OEM);
Maintenance/Other Services
Product Lines: Laser
Net Sales: \$5 Million - \$25 Million
(1981)
Contacta:
Head of Sales: Peter DilMaria

Contacta:
Head of Sales: Peter DiMaria
Head of Engineering: Martin Seelig
Head of Customer Service: Marlene
Erhardt
Geographic Coverage: International
Year Established: 1999
Number of Employees: 150

CORNING GLASS WORKS Telecomm Products Baron Steuben Place Coming, NY 14831 (607) 974-4411 Major Market: Communications Equipment Manufacturing Product Lines: Fiber Optic Contacts: Head of Marketing: David Duke Head of Sales: Peter Radding Geographic Coverage: International Year Established: 1975 Number of Employees: 30,000

CPT CORP.
8100 Mitchell Road
P.O. Box 295
Minneapolis, MN 55440
(612) 937-8000
Major Market Communications
Equipment and Office Equipment
Manufacturing; Software House;
Systems House (Commercial OEM)
Product Lines: Microwave and
Satellite Equipment
Contacts:
Head of Marketing: Fred Valfer
Head of Salies: Bob Gallagher
Head of Explications of Salies and Salies
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DARDONE, INC.
5725 E. River Road
Chicago, II. 60081
(312) 989-1610
Major Market: Communications
Equipment Manufacturing;
Maintenance/Other Services
Product Lines: Satellite Services;
Satellite Equipment
Net Sales: \$5 Million - \$25 Million
(1981)
Contacta:
Head of Sales: Bob Stewart
Geographic Coverage: International
Year Established: 1969
Number of Employees: 50

DATA GENERAL CORP.
Information Systems Division
4400 Computer Drive
Westboro, MA 01580
(617) 868-8911
Major Market: Component,
Computer, Peripheral and
Communications Equipment
Manufacturing; Software House;
Data Services (Service Bureau);
Maintenance/Other Services
Product Lines: Microwave Services;
Satellitic Services; Digital Termination
services; Microwave Equipment
Contacts:
Head of Marketing: Dave Lyons
Head of Marketing: Dave Lyons
Head of Marketing: Dave Lyons
Head of Sales: Jim Hertzel
Head of Marketing: Dave Lyons
Head of Sales: Jim Hertzel
Head of Marketing: Dave Lyons
Head of Sales: Jim Hertzel
Head of Software: Al Soura
Geographic Coverage: International
Year Established: 1989
Humber of Employees: 15,000

DEVELCON ELECTRONICS, INC. 4037 Swamp Road Doylestown, PA 18901 (800) 528-8423 Major Market: Communications Equipment Manufacturing; Dealer/Distributor:

Maintenance/Other Services
Product Lines: Long Lines (MCI,
Sprint, Bell; Cellular Radio
Contracta:
Head of Marketing: Tony Severino
Head of Sales: John Roberts
Head of Engineering: Tom Taschuk
Head of Customer Service: Fred
Field
Geographic Coverage: Internations
Year Extablished: 1978
Number of Employees: 275,050

DIEBOLD, INC.

818 Mulberry S.E.
P.O. Box 8230
Carton, OH 44711
(216) 483-400
Major Market: Component,
Computer, Terminal and
Communications Equipment
Manufacturing; OEM (Computer
Systems): Software House; Systems
House (Commercial OEM);
Maintenance/Other Services
Product Linea: Microwave
Equipment
Nat Salea: More than \$100 Million
(1982)
Contracts:
Head of Marketing: Robert Mahoney
Head of Salea: Robert Barone

Head of Engineering: Al Warf
Geographic Coverage: International
Year Established: 1859
Number of Employees: 6,000

DYNAMIC SCIENCES, INC.
7860 Gloria Ave.
Van Nuys, CA 91406
(213) 782-0820
Mejor Market: Component
Marufacturing; Communications
Equipment Manufacturing; COEM
(Computer Systems): Software
House
Product Lines: Microwave Services;
Satellite Services; Long Lines (MCI,

Sprint, Bell); Digital Termination Services; Cellular Radio; Microwave Equipment; Satellite Equipment; Fiber Optic Net Salea: \$5 Million - \$25 Million (1981)

Head of Marketing: Daniel Donovan Head of Sales: Jim Pyle Head of Engineering: Jack Birdsall Geographic Coverage: International Year Established: 1972 Number of Employees: 180

DYNAMICS SCIENCES, INC.

2341 Jefferson Davis Highway Sentry Blvd. Arlington, VA 22202 (203) 979-1945 Major Markete Component, Computer, Terminal and Communications Equipment Marufacturing; OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM); Dealer/Distributor; Maintenance/Other Services; Miscellaneous Computer Supplies; Digital Panel Reader Product Lines: Satellite Services; Digital Termination Services; Cellular Radio; Microwave Equipment; Satellite Equipment; Fiber Optic Contactas: Head of Marketing: Daniel Donovan Head of Sales: Donald Utt Head of Customer Service: G. Altrnus Number of Employees: 140

EMI COMPUTER SYSTEMS, INC. 6701 Seybold Road

P.O. Box 4272
Madison, Will 53719
(808) 274-4180
Major Market: Software House;
Detributor; Dealer
Product Linea: Fiber Optic
Net Salea: Less than \$100,000
(1982)
Geographic Coverage: National
Year Established: 1980
Number of Employees: 2

ERICSON PROGMATIC, INC.
11211 Richmond Ave.
Houston, TX, 77082
Major Market: Communications
Equipment Manufacturing; OEM
(Peripherals-Terminals)
Product Lines: Cellular Radio
Contacts:
Head of Marketing: Peter Walsh
Number of Employees: 65

FIBERGUIDE INDUSTRIES, INC.
33 Toppler Dr.
Sterling, NJ. 07980 (201) 647-6801
Major Market Communications Equipment Manufacturing Product Lines: Fiber Optic Contacts:
Head of Marketing: W. G. Bozarth Geographic Coverage: U.S. Year Established: 1978 Number of Employees: 8

PIBROMICS INTERNATIONAL, INC.
218 W. Main St. Hyannis, MA 02601 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 778-0700 (617) 78-0700

Weinberg
Head of Sales: Kenneth Bowes
Geographic Coverage: International
Year Established: 1977
Number of Employees: 106
FORD AEROSPACE &

COMMUNICATIONS CORP.
WDL
3939 Fabian Way
Palo Alto, CA 94303
(415) 852-4000
Major Market: Communications
Equipment Manufacturing; OEM
(Computer Systems)

Product Lines: Microwave Services Contacts: Head of Marketing: Charles Stiles Head of Software: Kenneth L. Rose Head of Engineering: Jack Thomell Head of Customer Service: Robert Berry Geographic Coverage: International Year Establishect: 1957 Number of Employees: 5,000

PUJITSU AMERICA, 89C..
2075 Oakmead Village Dr.
Santa Clara, CA 95051
(408) 727-4300
Mejor Markset: Peripheral,
Communications Equipment and
Office Equipment Menufacturing;
Dealer/Distributor
Product Lines: Satellite Services;
Long Lines (MCI, Sprint, Bell);
Microwave Equipment; Satellite
Equipment; Eber Optic; Laser
Net Sales: More than \$100 Million
(1981)

Head of Marketing/Sales: Norm Peterson Head of Software: Fred Bihler Head of Engineering: Ken Katashiba Geographic Coverage: International Year Established: 1976 Number of Employees: 300

GAMBALE DATA, INC.

1019 S. Noel Ave.
Wheeling, IL. 60090
(312) 541-6060
Major Market Communications
Equipment Manufacturing
Product Lines: Fiber Optic
Contacts:
Head of Marketing: Verne
Lugenbuhler
Head of Engineering: Jan Bartlett
Geographic Coverage: International
Year Established: 1973
Number of Employees: 325

BENCOSA, INC.
Suite 800
12221 Merit Dr.
Dallas, TX 75951
(214) 960-1977
Major Market: Dealer/Distributor;
Maintenance/Other Services
(1981)
Corriactis:
Head of Sales/Customer Service: Bill
Poblinson
Head of Software: Tony Hoffman
Head of Engineering, Kenneth Wilson
Geographic Coverage: National
Year Established: 1951
Number of Employees: 30

GTE NETWORK SYSTEMS
400 N. Wolf Road
Northlake, II. 60184
(312) 681-7100
Major Markett: Communications
Equipment Manufacturing
Product Lines: Microwave Services;
Microwave Equipment
Constacts:
Head of Marketing: George Bradley
Year Established: 1983
Number of Employees: 10,000

MARRIS CORP.
Government Systems Sector
1025 W. Nasa Blvd.
P.O. Box 37
Melbourne, FL 32902
(305) 727-4000
Major Market: Custom Systems
Product Lines: Microwave Services;
Satellite Services
Net Sales: More than \$100 Million
(1981)
Contacts:
Head of Marketing: Lee Woods
Geographic Coverses: international

HARRIS CORP.
Satellite Communications Division
1301 Woddy Burke Road
P.O. Box 1700
Melibourne, FL 32902
(305) 724-3000
Major Market: Communications
Equipment Manufacturing
Product Lines: Satellite Equipment
Confacts:
Head of Marketing: Raymond Pawley
Head of Marketing: Raymond Pawley

MARRIS CORP.
Farinon Lightwave Division
643 Bair Island Road
Redwood City, CA 94063
(415) 364-544
Major Markett: Communications
Equipment Manufacturing
Product Lines: Fiber Optic
Contactas:
Head of Marketing: Elliot Gilbert
Geographic Goverage: International
Year Established: 1982

MARRIS CORP.
Farinon Division
1991 Bayport Ave.
San Carlos, CA 94070
(415) 594-300
Major Market: Communications
Equipment Manufacturing
Product Lines: Microwave
Equipment Contacts:
Contacts:
Head of Marketing: Colin Pallemaerts

HDR SYSTEMS, INC. 8404 Indian Hills D Omaha, NE 68114 (402) 399-1400 Major Market: Component and Communications Equipment Manufacturing; OEM (Computer Systems); OEM (Peripherals-Terminals); Software House; Systems House (Commercial OEM); Data Services (Service Bureau) Product Lines: Long Lines (MCI, Sprint Bell) Net Sales: \$1 Million - \$5 Million (1981)Contacts Head of Marketing: Terry Ptrzelka Head of Sales: Ron Gillespie Head of Software: Chung Le Head of Customer Service: Tom Provost Geographic Coverage: National Year Established: 1969 Number of Employeeu: 45

HEWLETT PACKARD CO. Corporate Headquarters

5000 Hannway St. P.O. Box 10301 Palo Alto, CA 94304 (408) 996-9800 Major Market: Component. Computer, Terminal, Peripheral and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Software House: Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor; Maintenance/Other Services: Miscellaneous Computer Supplies Product Lines: Fiber Optic Net Sales: More than \$100 Million (1982)Contacts: Head of Marketing: Al Oliverio Head of Sales: Jim Arthur Head of Software: Andre Schwager Geographic Coverage: International Year Established: 1939 Number of Employees: 72,000

SIGHIBROEIS, INC.
Corporate Headquarters
7 Wellington Rd.
Lincoln, RI 02865
(401) 333-36-2010 help of Markett Perjohanal and
Communications Equipment
Manufacturing
Product Linese: Satellite Equipment
Manufacturing
1(1981)
Contacts:
Head of Marketing: Jack Simpson
Head of Sales: T. J. Daniels
Head of Engineering: Ed Salzillo
Geographic Coverage: International
Year Established: 1958
Humber of Employsees: 150

INTERNATIONAL DATA

ITT TELECOM PRODUCTS, 3100 Highwoods Blvd. Relainh NC 27804 (919) 872-3759 Rejor Market: Component. Computer, Terminal, Peripheral and Communications Equipment Manufacturing: Software House Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor: Maintenance/Other Services; Miscellaneous Computer Supplie Product Lines: Cellular Radio: Fiber Optic Head of Marketing: Ken Ray Head of Software/Engineering: W.L. Glomb Head of Customer Service: George Young Jr.

KANW SYSTEMS CORP. 8307 Highway 11 W. Austin, TX. 78735 (512) 288-1453 Major Market: Computer, Peripheral, Communications Equipment and Interface Manufacturing Product Lines: Microwave Equipment; Sabellite Equipment;

Geographic Coverage: International Year Established: 1983 Number of Employees: 8,500 Fiber Optic; Laser
Net Sales: \$5 Million - \$25 Million (1982)
Contracts:
Head of Marketing: Fred Klingensmith
Head of Sales: Steve Stillman
Head of Software: Herry D. Keims
Head of Software: Herry D. Keims
Head of Engineering: Thomas Allen
Head of Customer Service: Karen
Williey
Geographic Coverage: International
Year Established: 1975
Number of Employees: 60

L.M. ERICSSON
TELECOMMUNICATIONS, INC.
370 Crossways Park
Woodbury, NY 11797
(516)
Major Market: Communications
Equipment Manufacturing
Product Lines: Microwave Services;
Statellite Services; Microwave
Equipment; Satellite Equipment;
Plob Optic: Laser

LIGHTWAVE COMMUNICATIONS 650 Danburry Road Ridgefield, CT 06877 (203) 438-9625 Product Lines: Fiber Optic

LINCOLN TELEPHONE

SERIVICES & SUPPLY, INC.
4900 Superior St.
14900 Superior Superior Superior
14900 Superior Superior
14900 Superior Superior
14900 Superior
149

Number of Employees: 25

LOCUE, 184C,
P.O. Box 740
State College, PA 16801
(814) 468-8275
Major Mantet Component and
Communications Equipment
Manufacturing
Product Liness Satellite Equipment
Net Sales: \$5 Million - \$25 Million
(1981)
Head of Marketing: Waiter Coyle
Head of Engineering: Daniel
Larchuck
Geographic Coverage: National
Year Established: 1987
Number of Employees: 260

LORAL-TERRACOM Loral Corp. 9020 Balboa Ave. San Diego, CA 92123 (619) 278-4100 109 Part Market: Communications Equipment Manufacturing; Maintenance/Other Services Product Lines: Microwave Equipment Net Sales: \$1 Million - \$5 Million (1982) Contlactis: Head of Marketing: C. G. Imskeep Head of Engineering: Brian Martes Geographic Coverage: International Year Established: 1970 Number of Employees: 170

MIA-COM, INC.
M/A-COM Cable Home Group
Rt. 1
P.O. Box 199A
Catawba, NC 28609
(704) 241-3142
Major Market: Component and
Communications Equipment
Manufacturing
Product Lines: Microwave
Equipment: Satellite Equipment
Net Sales: \$25 Million - \$100 Million
(1981)
Head of Marketing: Frank Logan
Head of Sales: Gene Switcheribank
Geographic Coverage: International
Year Established: 1950

ber of Employees: 1,500

MATH ASSOCIATES, INC.
2200 Shames Drive
Vestberry, NY 11590
(516) 334-6800
(516) 334-6800
Major Market: Component,
Peripheral and Communications
Equipment Manufacturing;
Miscellaneous Computer Supplies;
Custom Communications Equipment
Product Lines: Fiber Optic; Laser
Contacts:
Head of Marketing: Bob DeLia
Head of Sales: Norman Fein
Head of Engineering; Irwin Math
Geographic Coverage: Western
Europe
Year Established: 1972
Number of Employees: 30

MCI INTERNATIONAL, INC.
One WLI Plaza
New York, NY 10004
(212) 983-6400
Major Market: Communications
Equipment Manufacturing;
Maintenance/Other Services
Product Lines: Long Lines (MCI,
Sprint, Bell)
Net Sales: More than \$100 Million
(1981)
Vair Established: 1983
Number of Employees: 1,400

MITEL, INC.
Mitel Semiconductor
5400 Broken Sound Blvd.
Boca Raton, FL 33431
(305) 994-8558
Major Market: Component,
Terminal, Peripheral,
Communications Equipment and
Office Equipment Manufacturing;
OEM (Peripherals-Terminals);
Dealer/Distributor
Product Lines: Long Lines (MCI,
Sprint, Beil); Digital Termination
Services

Contacts: Head of Sales: Gordon Turner Head of Engineering: Tom Mayer Geographic Coverage: National Year Established: 1971

BIOSELEY ASSOCIATES, INC.
Santa Barbara Research Park
111 Castilian Dr.
Goleta, CA. 93117
(805) 989-9621
Major Markett Component,
Communications Equipment
Manufacturing
Product Linest Microwave
Equipment
Contacts:
Head of Marketing: Charles Rockhill
Head of Sales: Kin Jones
Head of Customer Sonicia: Jim
Jones
Geographic Coverage: International
Year Established: 1950
Number of Employees: 150

MOTOROLA, INC. 1301 E. Algonquin Road Schaumburg, IL. 60196 (312) 576-7000 Major Market: Component, Computer, Terminal Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Systems House (Commercial OEM); Data Services (Service Bureau): Dealer/Distributor; Maintenance/Other Services; Miscellaneous Computer Supplies Product Lines: Satellite Services: Cellular Radio Head of Marketing: Bob Cecil Head of Sales: Art Sundry Head of Customer Service: Ira Walker Geographic Coverage: International Year Established: 1928 Number of Employees: 75,000

MOUNTAIN COMPUTER, INC. 300 El Pueblo Road Scotts Valley, CA 95066 (408) 438-6650 Major Market: Peripheral Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminals); Dealer/Distributor; Miscellaneous Computer Supplies: Storage System Product Lines: Cellular Radio Net Sales: \$1 Million - \$5 Million (1981)Head of Marketing: Robert Stroh Head of Software: George Proper Head of Engineering: Eric Swartz Head of Customer Service: Stan Scardino

NESCO 107 San Zeno Way Sunnyvale, CA 94086 (408) 737-2080 Major Market: Communications

Geographic Coverage: Inter Year Established: 1977 Number of Employees: 120

Equipment Manufacturing; Maintenance/Other Services; Communications Network Product Lines: Satellite Services; Long Lines (MC, Sprint, Bell); Digital Tarmination Services Contacts: Head of Marketing: Jim Peluso Head of Customer Service: Nancy Péluso

Geographic Coverage: International Year Established: 1975 Number of Employees: 30

NEVADA BELL
645 E. Plumb Lane
Reno, NV 39520
(702) 789-5000
Major Market: Telecommunications
Product Lines: Microwave Services;
Digital Termination Services
Contacts:
Head of Marketing/Sales: Don Van
Epps
Yeer Established: 1913
Number of Employees: 1,450

PRONTHERN TELECOM, INC.
1001 E. Arapaho Road
Nelson Highway 54
P.O. Box 13010
Richardson, TX 75081
(214) 238-4790
Major Markett: Computer, Terminal,
Peripheral and Communications
Equipment Manufacturing, OEM
(Computer Systems); OEM
(Computer Systems); OEM
(Computer Systems); OEM
(Computer Systems); OEM
(Peripherale-Terminals); Data
Services (Service Bureau);
Dealer/Distributor,
Maintenance/Other Services;
Miscelláneous Computer Supplies
Product Lines: Microwave
Equipment; Satellite Services;
Satellite Services;
Miscellaneous Computer Supplies
Product Lines: Microwave
Equipment; Satellite Equipment;
Fiber Optic
Constants:

Head of Sales: Nelson Boyd Geographic Coverage: International Year Established: 1971 Number of Employees: 15,000

NORTHERN TELECOM, INC.
Interrated Office Systems
100: East Arapsho Road
Richardson, TX 75081
(214) 234-5300
Major Market: Computer, Terminal,
Peripheral and Communications
Equipment Manufacturing; OEM
(Computer Systems);
Maintenance/Other Services
Product Lines: Microwave
Equipment; Fiber Optic
Net Sales: Over \$100 Million (1982)
Comlactes
Head of Marketing: Bob Dyer
Head of Sales: Nelson Boyd
Head of Software: Bruce Stevens
Head of Customer Services: Bob
Head of Customer Services: Bob

NOVATEL COMMUNICATIONS, INC. 2820 Peterson Place

Geographic Coverage: International Year Established: 1975 Number of Employees: 7,500

Norcross, GA. 30071
(404) 449-6666
Major Market: Communications
Equipment Manufacturing;
Maintenance/Other Services
Contacta:
Head of Marketing; Jake MacLeod
Head of Sales: Peter Zugus
Head of Customer Service: Bill Wight
Geographic Goverage: international
Year Estabilished: 1982
Number of Employsees: 500

OKI ELECTRONICS OF AMERIACA, INC.
5901-B Peach Tree Durwoody Road Atlanta, EA 30093 (ed-) 398-550 omponent, Computer, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Peripherals-Terminale); Software Nouse; Systems House (Commercial OEM); Data Services (Service Bureau); Dealer/Distributor; Maintenance/Other Services Product Lines: Cellular Radio Contacts: Head of Marketing/Customer Service: Steve Fields Head of Sales: Dick Fisher Geographic Coverage: International Year Establishact: 1969 Number of Employees: 225

P.R. HUGHES & CO., INC.
17 Howell Road
Sudbury, MA 01776
(617) 443-2453
Rejor Market: Communications
Equipment Manufacturing; OEM
(Computer Systems); Electronic
Equipment
Product Lines: Satellite Equipment
Geographic Coverage: International
Year Established: 1975
Number of Employees: 8

Number of Employees: 8

PA CEFIC TELECOM, INC.
305 Broadway
Vancouver, WA 98888
(206) 696-0983
Major Markets Communications
Equipment Manufacturing: OEM
(Computer Systems).
Maintenancel Other Services
Product Linear: Microwave
Equipment; Satellite Equipment;
Fiber Optic, Laser
Contacts:
Head of Marketing: Chuck Russell
Head of Engineering: Jim Warwick.
Head of Gustomer Service: Greg
Bogus
Oeographic Coverage: Regional
Year Established: 1975
Number of Employees: 2,200

Number of Employees: 2,200

PACNET CORP.
8321 Lemmon Ave.
Dallas, TX 75209
(214) 353-0396
(214) 353-0396
Rajor Market Communications
Equipment Manufacturing;
Maintenanco/Other Services
Product Lines: Satellite Services;

Long Lines (MCI. print, Bell): Digital Termination Services; Satellite Equiprient Contacts: Head of Marketing: Gilbert Williams Head of Sales: George Kelly Head of Engineering: Doug Littlewood Geographic Coverage: National Year Established: 1972 Number of Employees: 32

PANASONIC INDUSTRIAL CO. Matsushita Electronic Corp. of America One Panasonic Way Secaucus, NJ 07094 (201) 348-7000 Major Markett Component, Computer, Peripheral, Communications Equipment and Office Equipment Manufacturing; OEM (Ceripherals Farminals), DEM (Peripherals Farminals), Dealer (Distributor; Maintenance/Other Services Product Lines: Cellular Radio Contacts: Head of Marketing: Scott Minakuril Head of Sales Joe Shothloku Geographic Coverage: International Year Establishaet 1982 Number of Employees: 800

PMALO COMP.
Optical Systems
85 Moreland Road
Simi Valley, CA
(805) 522-3933
Major Market Communications
Equipment Manufacturing;
Maintenance/Other Services
Product Lines: Fiber Optic
Contacts:
Head of Sales: Jim Rodgers
Year Established: 1981

PULSECOM

2900 Towerview Road Herdon, VA 22071 (703) 471-250 Mejor Market: Communications Equipment Manufacturing; Software House; Systems House (Commercial DEM) Product Lines: Microwave Equipment; Satellite Equipment Contacts: Head of Marketing: Michael Vinocur Head of Engineering; James Britt Geographic Coverage: National Yaer Established: 1963 Number of Employees: 300

RACON, INC.
12628 Interruban Ave. S.
Seattle, WA. 98188
Seattle, WA. 98188
Good 24-1110
Major Market: Communications
Equipment Manufacturing
Product Linea: Microwave
Equipment
Net Sales: \$500,00 - \$1 Million
(1981)
Contacts:
Head of Marketing: Susan Furushiro
Head of Sales: James Dooley
Geographic Coverage: International
Year Established: 1989

Number of Employees: 55

RCA AMERICAN
COMMUNICATIONS, INC.
400 College Road E.
Princeton, NJ 08540
(609) 734-4000
Melor Market: Communications
Equipment Menufacturing
Product Lines: Satellite Services
Contacts:
Head of Marketing; John Williamsor
Head of Sales: Murray Fruchter
Head of Customer Service: J. F.
Linderwood
Geographic Coverage: National
Year Established: 1976
Number of Employees: 500

ROCK WELL INTERNATIONAL
Collins Transmission Systems
1200 N. Almis Road
P.O. Box 10462
P.O. Box 10462
Richardson, TX 75207
(214) 996-5000
Major Markete Communications
Equipment Manufacturing
Product Lines Microwave
Equipment; Satellite Equipment;
Fiber Optic
Contracts:
Head of Marketing: Vroman Riley
Head of Salins: Les Fisher
Geographic Coverage: International
Year Established: 1928
Number of Employees: 5,500

ROTELCOM
106 Central Ave.
Contraind, NY 13045
(607) 756-7511
Major Markett Communications
Equipment Manufacturing;
Dealer/Distributor
Product Lines: Fiber Optic
Contacts:
Head of Marketing: Loraine Healin
Head of Sales: Greg Merrill
Head of Castomer Service: Paula
Barber
Number of Employees: 150

BCHENTIFIC ATLANTA, INC.
Corporate Headquarters
One Technology Parkway
P.O. Box 105600
Adianta, OA. 30346
(404) 449-2000
Major Markete Communications
Equipment Manufacturing; Software
House
Product Linea: Satellite Equipment
Net Sales: More than \$100 Million
(1982)
Contacts:
Head of Marketing: Del Bothof
Head of Engineering: Dr. Guy
Beakley
Geographic Coverage: International
Year Established: 1952
Number of Employees: 5,000

SHECON FISERLAM
P.O. Box 12726
Research Triangle Park, NC 27709
(919) 544-3791
Major Market: Communications
Equipment Manufacturing; OEM
(Computer Systems); Systems

House (Commercial OEM): Maintenance/Other Services Contacts: Head of Marketing: Glenn R. Constable Head of Sales: Russell Stanley Head of Engineering: Richard Jones Year Established: 1982 Number of Employees: 17

SOUTHERN BELL TELEPHONE AND TELEGRAPH CO.

675 W. Peachtree St. N.E. Atlanta GA 30375 (404) 529-8611 Major Market: Telecommunications Product Lines: Microwave Services; Digital Termination Services; Cellular Radio Contac Head of Marketing: Donald B. Daves Year Established: 1879 Number of Employees: 72,000

TELEPHONE COMPUTER CO.,

1930 Isaac Newton Square Reston, VA 22090 (703) 435-5100 Major Market: Computer Manufacturing; Communications Equipment Manufacturing; OEM (Peripherals-Terminals); Software Product Lines: Long Lines (MCI, Sprint, Bell) Net Sales: \$1 Million - \$5 Million Contacts: Head of Marketing: Ron Elasik Year Established: 1979 Number of Employees: 15

TERRACOM 9020 Balboa Ave. San Diego, CA 92123 (619) 278-4100 Aajor Market: Communications **Equipment Manufacturing** Product Lines: Microwave Equipment Head of Marketing: Mike Labadula Geographic Coverage: International Year Established: 1970 Number of Employees: 185

THE OHIO BELL TELEPHONE

Headquarters 100 Erieview Plaza Cleveland, OH 44144 (216) 822-9700 ojor Market: Dealer/Distributor; Telecommunications Product Lines: Microwave Services; Digital Termination Services Head of Marketing: Leo Richard Year Established: 1921 Number of Employees: 16,300

2560 Mission College Blvd. Santa Clara, CA 95050 (408) 496-0111 Major Market: Communications **Equipment Manufacturing Product Lines: Digital Termination** Services; Fiber Optic Nat Sales: \$5 Million - \$25 Million

(1982)Contacts: Head of Marketing: James Jordan Head of Software: Cary Wyman Head of Engineering: Robert Ryan Head of Customer Service: Bruce Jackson Geographic Coverage: International Year Established: 1979 Number of Employees: 350

VALTEC 99 Hartwell St. West Boylston, MA 01583 (617) 835-6082 Asjor Market: Communications Equipment Manufacturing; Maintenance/Other Services Product Lines: Fiber Optic Head of Marketing: Marguerite Shaplis Head of Sales: George Golebiowski Geographic Coverage: International Year Established: 1967 Number of Employees: 200

VERISTRON, INC. 6310 Chillum Place N.W. Washington, DC 20011 (202) 882-8464 ajor Market: Communications **Equipment Manufacturing** Product Lines: Flore Optic Geographic Coverage: International Year Established: 1958 Number of Employees: 50

WESTERN MULTIPLEX CORP. 1045 Howard Ave San Carlos, CA 94070 (415) 592-8832 Major Market: Communications Equipment Manufacturing Contacts: Head of Marketing: John P. Bartelme Geographic Coverage: International Year Established: 1980 Number of Employees: 11

WISCONSIN TELEPHONE CO. 722 N. Broad St. Milwaukee, WI 53201

(414) 456-3000 Major Market: Dealer/Distributor; Telecommunications **Product Lines: Digital Termination** Services Head of Marketing: Gary Van Olke Head of Customer Service: Chuck Dickson Year Established: 1883 Number of Employees: 9,000

XYPLEX, INC.

Concord, MA 01742

Major Market: Peripheral and Communications Equipment

Product Lines: Long Lines (MCI, Sprint, Bell); Digital Termination Services; Fiber Optic

100 Domino Dr.

(617) 371-1400

Manufacturing

Head of Marketing: Robert Head of Engineering: George Comant Geographic Coverage: National Year Established: 1981 Number of Employees: 5 ZOOM TELEPHONICS, INC. 207 South St. Boston, MA 02111 (617) 423-1239 Major Market: Communications Equipment Manufacturing Product Lines: Long Lines (MCI, Sprint, Bell) Head of Marketing: Ralph Hays

iber of Employees: 50

ADVERTISER'S INDEX

# Advertiser's Index

<b>Advanced Computer Communications</b>	AC	C	)		 				 		 			 7	Tai	bL	)iv	ide	W C
Anchor Pad International, Inc					 				 		 							A	-15
BBN Communications Corp																			
Codex Corp.																			
Concord Data Systems, Inc.					 				 		 					•	-	A	- 49
CPT Corp					 	*	15		 				2.	 . !	18	DI	JIV	TOPE	NB
CW Communications/Inc.																			
Gandalf Data, Inc					 			 	 		 					A-	33	i, A	-83
General Datacomm Industries, Inc					 				 					 					. 1
Glasgal Communications, Inc					 				 					 				A	-43
ICOT Corp																			
Leading Edge Products, Inc.																			
Local Data, Inc.																			
M/A-COM Linkabit, Inc.																			
Micom Systems, Inc					 					 				 				. A	-41
MTI Systems Corp					 				 	 				 		A	-5	1, E	3-17
National Products Marketing, Inc																			
Persyst, Inc.																			
Philips Electronic Instruments, Inc																			
Phone 1, Inc																			
Televideo Systems, Inc				٠,						 				 					25
Tellabs, Inc.					 			 		 				 					
Universal Data Systems, Inc																			
Wang Laboratories, Inc.																			

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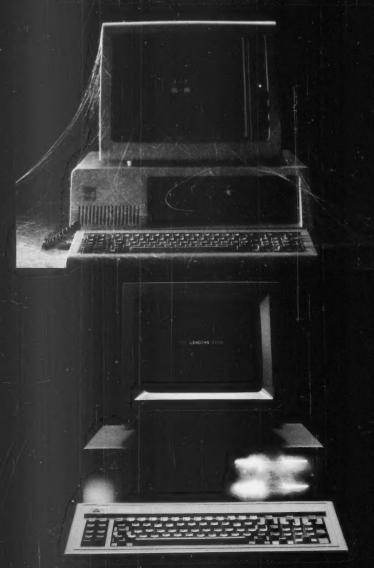
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